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THE PERCEPTION OF MUSIC SYMBOLS IN MUSIC READING BY NORMAL CHILDREN AND BY CHILDREN GIFTED MUSICALLY*

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I. Introduction

Introductory Statement

THE COMPLEX patterns of sounds which are called music may, subject to certain limitations, be indicated with a relatively high degree of accuracy through the use of an equally complex system of musical notation. This system utilizes three types of symbols: (1) those which indicate the pitch of musical sounds; (2) those which indicate the temporal duration of musical sounds; and (3) those which indicate certain related aspects of musical interpretation such as tempo, dynamics, phrasing, and style of performance. Music reading is a highly complex process because it involves not only the recognition and interpretation of these various symbols, but frequently requires a simultaneous response in terms of vocal or instrumental performance.

A study of the professional literature shows that several terms may be used to identify the process of reading music, or to identify a specific kind of level of music-reading activity. The present study defines music reading as the process of reading and interpreting the various kinds of music symbols and converting these symbols into sound. This does not imply accurate reproduction at first sight but does suggest that the individual needs to acquire sufficient skill in understanding and interpreting the meaning of the symbols so as to ultimately reach a high level of correct response. The symbols become a guide for action, with the individual making frequent value judgments regarding the accuracy of his performance, and consequently changing that performance to agree with those judgments.

Music educators are agreed as to the significance of music reading skills in the musical development of the individual. This type of skill is considered an essential element of musical understanding and appreciation, as well as of independent musical performance. Consequently, the music program of the school gives considerable emphasis to a variety of activities designed to facilitate the development of this skill. However, there has been little systematic research concerned with the several aspects of music reading although considerable discussion has taken place regarding the following:

1. Adequate identification of the learning process as it applies to music reading.
2. Development of effective procedures for teaching music reading.
3. Designing effective instruments to measure and evaluate music reading competence.
4. Determining reasonable levels of music reading competence for children representing various grade levels and various degrees of musical ability.

Purpose of the Study

The present study seeks to develop experimental learning situations which would provide significant information regarding the perception of music symbols by children of average musical ability and children gifted musically at the fourth and sixth grade levels. The process of reading music appears to depend upon three perceptual levels: 1) the auditory perception of musical sounds; 2) the visual perception of musical symbols; and 3) the integrative, internalized process through which the individual organizes previous auditory and visual perceptions of given stimuli in order to react to these same, or similar, stimuli as they appear in new learning situations. Each

*The research reported herein was performed pursuant to a contract with the U. S. Office of Education, Department of Health, Education, and Welfare. The writer wishes to acknowledge the assistance and cooperation given by the children of the Madison, Wisconsin, elementary schools; their special music teachers; and Dr. Philip Falk, Superintendent of Schools, and Mr. LeRoy Klose, Supervisor of Music.

of these three perceptual levels will be explored experimentally, comparisons will be made in terms of the two groups of children at each of the two grade levels, and hypotheses will be tested.

This study deals primarily with reading those music symbols which indicate pitch; other kinds of symbols are to be considered in future investigations. Many music educators recommend that music reading skills can be developed by learning a "vocabulary" of tonal patterns, or configurations, which can then be applied to new situations. The basic assumption underlying this approach is that such tonal configurations, when learned by the child, retain their visual identity in different contexts. While the professional literature shows almost complete agreement that music reading is a response to a group of notes rather than to single notes, there is less agreement as to the procedures to be followed. Is there a standard list of tonal configurations which should be learned apart from the song materials themselves, or should the tonal configurations to be learned be taken directly out of the song materials for study and then returned to their original context?

The hypotheses of the study are as follows:

1. Normal children perceive and act upon music symbols in essentially the same way as do children gifted musically.
2. Certain tonal configurations which are readily perceived in isolation by both groups of children tend to retain their identity when presented in the more usual context of a song.
3. There are no significant differences between the ability to perceive a tonal configuration aurally and the visual perception of these same configurations.
4. Age, previous musical experience and musical ability are significant factors in developing skill in perceiving and reacting to music symbols.

Procedures of the Study

The procedures followed in the study are briefly outlined below and will be discussed in detail in a later section of this report.

1. Analysis of song materials to identify common tonal configurations which may be used as test items.
2. Selection of subjects for the study and collection of certain personal data on each subject.
3. Construction of an initial test and administration of this test to approximately 100 subjects selected at random from the fourth fifth and sixth grade pupils. This constitutes Phase I of the study and will provide one means of examining perception as the visual and aural identification and recognition of tonal configurations. It will also establish, in part, the basis for selecting learning tasks appropriate to Phase II of the study and provide an opportunity to study the techniques appropriate for the collection and analysis of the data.
4. Construction of the test materials for Phase II of the study and administration of the test to 150 average and musically gifted children in both fourth and sixth grades. Phase II is primarily concerned with perception as an integrative, internalized process through which the individual relates his auditory and visual perceptions of tonal configurations to his perception of these same configurations as they appear in a different setting.
5. Final analysis of the data, with small group comparisons between grades and between groups being made.

The testing carried on in the study is all individual, with the data gathered by tape-recording the pupil responses in the testing situations and later subjecting these recordings to detailed analysis. Tape recording the pupil responses in the testing situation eliminated the need for immediate scoring and tabulating and insured accuracy of the data since questionable responses could readily be repeated for verification.

Throughout the present study the level of skill in music reading is measured in terms of a vocal response to the stimuli. When an instrumental response is used, it is difficult to judge whether the subject really understands and interprets the musical symbols being read, or whether the response is mechanical and is being made in terms of fingering patterns. Vocal response was considered to be the most practical for the study because all children had had extensive experience in singing as a part of the regular music program. The use of an instrumental response would have further restricted the study to a relatively small selective group and thus defeated the primary purpose of the investigation.

II. Summary of Related Information

The writer made an extensive analysis of the professional literature related to the basic problem of music reading. The problem of developing skill in music reading has been a fertile topic for discussion in the professional literature for a period of many years. Music educators have offered many suggestions and recommendations with reference to appropriate procedures for the development of this highly specialized skill. The objectives of the music program in the schools, as stated by authorities in the field, have always mentioned the need for acquiring a certain level of music reading skill. There exists, however, a

considerable amount of uncertainty regarding exactly why children need to learn how to read music, as well as a general tendency to avoid making specific recommendations regarding effective and adequate procedures which might be followed. One valid reason for the vagueness with which these two points are discussed may well be due to the lack of adequate research information.

The literature concerned with the topic of music reading may be grouped into three broad categories:

1. The historical background of musical notation and of syllabic devices for interpreting musical notation.
2. Professional literature which includes courses of study, specialized music education methods books, and the many articles in professional journals which report the opinions, experiences, and recommendations based upon personal experience.
3. Research literature.

For the sake of brevity, the writer will present only a partial summary of certain pertinent research literature.

Analysis of the research in the specific area of music reading reveals the following pertinent information. One group of studies has approached the problem through a detailed analysis of the eye movements of persons engaged in reading music. Jacobson (4) following the procedures of Gray and Buswell in the field of language reading, carried forward a detailed photographic analysis of eye movements as a means of identifying the various stages in the development of music reading ability. The section of the report which is pertinent to the present study deals with the reading of vocal music by three college students and three sixth-grade pupils. A detailed analysis of the performance of each subject is presented and the results are briefly summarized here. The less mature reader required pauses almost twice as great as the mature reader but the number of pauses did not differ significantly. The span of recognition, which included both words and notes, seldom exceeded two notes for the mature reader and was smaller than the span of the earlier instrumental reading. The smaller intervals were read correctly more often than longer intervals, use of tonic sol-fa syllables resulted in longer pauses than when words were used; and sol-fa syllables were found to be of no benefit to the subjects. The author offers several suggested applications of the results of this study to classroom instruction which seem to indicate that new and simplified reading materials are needed to develop the immature reader.

Ortmann (7) summarized one of his investigations by pointing out that the span of vision depends a great deal upon the placement and pattern of the notes. He found the field of clear vision to be a circle varying between 1/4 and 1/3 inch in diameter with no difficulty encountered in reacting to notes within this area. The chief determinants of difficulty in note reading, not involving actual eye movements, are: a) the number of notes in the field of clear vision, b) the area covered by the distribution of the notes, c) the number of linear dimensions involved (i.e., combinations of vertical horizontal, or oblique), d) the complexity or symmetry of the note pattern, and e) the meaning of the note group as a melodic and/or harmonic pattern. He points out that difficulties in note reading, for the normal pupil, result from an inability to group a distribution of notes into larger perceptual units. Familiarity with musical notation is quite obviously a significant factor in accuracy of reading.

A third study of eye movements in music reading was carried on by Weaver (10) using trained musicians, with the piano as the performance medium. His experimental reading materials were harmonic, melodic, and single melody with supporting chords. The rhythmic element was retained in all types as a means of accurately measuring the number and duration of reading pauses. The results indicate that note reading relates more closely to reading algebraic formulae than to language reading, assuming that one musical note is equivalent to one word. The average number of notes played per reading pause varied between one and two, with spacing of notes and harmonic grouping being important factors. The duration of reading pauses depended upon the type of musical material being read, with those for harmonic and melodic material reliably shorter than those required in reading an accompanied melody. A higher correlation exists between reading time and pause duration than between reading time and the number of pauses. Weaver also found that performance in his study provided little basis for distinguishing types of readers because of the individual differences in performing the different selections. It is significant that he identified the average perceptual span as varying between three and five notes. A companion study by Weaver and Van Nuys (11) was particularly concerned with the relationships between the rhythmic and melodic elements of music as they affected occular and manual behavior. The immediate memory span was used as a criterion of difficulty in determining the eye-hand span, with immediate memory span defined as the amount of material which could be visually explored, perceptually organized and retained until played. The results showed that memory span decreases as the complexity of note relations increases for both rhythm and melody. The memory span for a combination of a simple rhythm and melody is only slightly smaller than the span for each alone. In more complex combinations, the melodic element seems to prove

more difficult than the rhythmic. Melodic factors limit memory span whenever the melody is not extremely simple; rhythmic factors limit the rate of reading when complex rhythms are used. If music reading skill is to be developed so more rapid responses are made, individuals need to improve in the ability to apprehend pitch patterns as stable melodic segments and to grasp rhythms as rhythmic figures.

Bean (1) sought to determine the complexity of the musical pattern which could be perceived at one fixation of the eyes by individuals with varying amounts of training. He also studied the effects of tachistoscopic training on the span of perception. The investigation showed that the ability to grasp a musical pattern of three or more notes at a glance was essential to rapid, accurate reading. The perceptual unit is determined by the duration of notes, the distribution of notes on the staff, the closeness of note groupings, and the irregularity or unusual characteristics of patterns. These factors all operate to determine the ease with which material is grasped by the reader. Disjunct melodic patterns, rhythmic patterns which could not readily be subdivided into logical sub-groups, unfamiliar musical material, and uneven distribution of chord tones appear more difficult to perceive than other types of material.

Christ (2) employed tachistoscopic training as a means of improving the ability to perceive and reproduce rhythmic units. The results showed that such drill yielded significant gains but no attempt was made to determine the permanence of such drill or to relate such drill to rhythmic reading of typical music. Stokes (9) investigated the effect of tachistoscopic training on reading melodic material. The results, however, showed that the gains on a post-test could not be considered due to the influence of the specific training program alone. An interesting instrument for testing the sight-reading performance of instrumental performers was constructed by Stokes and contains several valuable suggestions. The testing results show, however, that tachistoscopic training had no effect upon general achievement in reading music and that there was little evidence of carry-over.

Smiley (8) investigated the music reading "vocabulary" in basic music texts at the fourth-grade level and found the total number of tonal configurations to be far too many for the child to respond to readily. The 351 configurations could, on the basis of frequency of use, be reduced to approximately 20, each containing from two to five notes. Further analysis led Smiley to conclude that it might be more valuable for the child to learn a basic list of two-note configurations of seconds and thirds. The procedures suggested by Smiley for identifying tonal configurations were a valuable guide for the analysis made by the writer.

This reported research in music reading has been primarily concerned with certain aspects of visual perception or of physical behavior during the process of reading music. Such research has not yet provided an adequate basis for prescribing instructional procedures to develop musical concepts which may be readily utilized in a total musical setting. Apart from a few reports of actual classroom experimentation in the problem area, there is little information regarding the ways in which children of elementary school age react to musical notation because the majority of the studies have used older subjects. The survey of literature again re-emphasizes the need for continued, systematic investigation of this, and other problems in music education.

III. Procedures of the Study

A. Analysis of Songs

The initial step taken in the study was a detailed analysis of 326 songs selected at random from eighteen of the basic song-texts used in grades three through six. Since the subjects for the study were to be selected from the fourth, fifth, and sixth grades, it was necessary to use test items with which they would be reasonably familiar as well as items which would be discriminating. The purpose of the analysis was to identify tonal configurations and select test items on the basis of the frequency of appearance of certain tonal configurations in songs.

The procedures followed in identifying the tonal configurations were suggested, in part, by Smiley (8). Other suggestions were obtained from the teachers' manuals to the basic song-texts and from professional books and articles whose authors advocated the "pattern" approach to music reading. The following rules were set up to serve as a guide in defining a tonal configuration:

1. Thirty page numbers, chosen from a table of random numbers, were set up for each of the eighteen song-texts. Although only eighteen songs in each book were to be analyzed, the additional songs were necessary as alternates because of the decision to eliminate songs in a minor mode or songs containing frequent chromatic or modulatory passages.
2. All types of songs were included in the analysis, no distinction being made between specific reading songs, rote songs, or rote-note songs.
3. Single intervals were generally not considered as tonal configurations since they do not imply any melodic flow or movement.
4. The interval between musical phrases was not usually included.
5. The interval within a phrase which appeared between the end of one distinct configuration and the beginning of another configuration was not in-

cluded unless the text showed that such an interval occurred in the middle of a word.

6. The interval between readily identifiable sequences was not included, each sequence being treated as a separate configuration.

7. Repetitions of single notes were considered as single notes; do-do-re-re-do-do- was analyzed as do-re-do. The decision to exclude repeated tones from configurations was made in order to simplify the analysis even though such repetitions occur frequently in songs.

8. In part songs, each part was analyzed separately only in those sections of the song where the soprano and alto parts were different.

9. In songs containing repetitions, only the new ending was analyzed, not the entire repetition.

10. Frequently the rhythmic structure within the measure or phrase could be used to assist in the identification of a complete tonal configuration.

11. The text of the song itself, particularly with reference to words of more than one syllable, could frequently be depended upon to be of assistance in accurately identifying the tonal configurations.

12. Within these guides, the decision regarding the length of the configurations had to be made by the investigator in terms of what the child could be expected to grasp. As a result, tonal configurations in excess of five or six tones were rarely identified as such.

Table I summarizes the numerical results of the analysis. The total number of different tonal configurations identified in the 326 songs was 558. The total frequency of these 558 configurations was 4575, with a frequency range of 1 to 213. It is significant that 47 tonal configurations, or only 8.42 percent of the total number identified, with a frequency range of 20 to 213, had a combined frequency count of 2585, or 56.50 percent of the total frequency count. Even more significant is the fact that 22 configurations, or not quite four percent of the total, with a frequency range of 44 to 213, had a combined frequency of 1939, or 42.38 percent of the total frequency count. Tonal configurations with a frequency range of 1 to 9, accounted for 460, or 82.44 percent of the total number of configurations, but had a combined frequency count of only 1327, or 29 percent of the total frequency count. The data points up the fact that there exists a relatively small number of tonal configurations which appear repeatedly in the songs children sing.

Had songs in a minor mode been analyzed, as well as songs containing chromatic and modulatory passages, the total number of tonal configurations would have been considerably in excess of 558. The situation is still further complicated by the fact that each one of these 558 configurations can be written in at least nine different major keys commonly used in these song-texts. Since each configuration has, therefore, nine different notational systems within which it could appear, the total possible number of 5022 configurations appears to present a very formidable problem to the music educator faced with the task of identifying effective methods for developing skill in music reading. Fortunately, the general outline or shape of a configuration remains constant from one tonality to another despite differences in actual notation. However, this problem of perceiving and identifying configurations when they are presented in several different tonalities needs careful investigation since it is frequently dismissed as being relatively unimportant.

Since the selection of test items was to be based, in part, upon the frequency of appearance in songs, the twenty-two most frequently used configurations are listed in Table II. For purposes of comparison, the twenty-two most frequently used configurations identified in the analysis made by Smiley are also presented. These twenty-two configurations represented 3.94 percent of the total number of configurations identified by the writer and 6.1 percent of the total number of configurations identified by Smiley. It is significant to note that although Smiley confined his analysis to fourth-grade songs identified as reading songs, his findings closely agree with those of the present investigator. Nineteen configurations are common to both lists, with each list containing only three configurations not found in the companion list. These configurations are identified by an asterisk. It would be reasonable to expect that analyses of this type, carried on by two investigators operating independently but following similar criteria of identification, would show comparable results.

In order to insure an adequate number of tonal configurations from which test items could be constructed, an additional 25 configurations were listed. These configurations, with a frequency range of 20 to 42, accounted for 646, or 14.12 percent of the total frequency count and are listed in Table III. It is significant to note that there again exists considerable agreement between the analysis made by Smiley and that made by the writer. Sixteen, or 64% of these 25 configurations appear on both lists. The 47 tonal configurations, with a frequency range of 20 to 213, which have been identified by the writer, included 35 configurations having a similar frequency range as identified by Smiley. This represents a concurrence of identification for 75 percent of the highest ranking items. No attempt was made to compare results of this analysis with the tonal configurations identified in professional books and teacher's guides to the basic song-texts since it was not considered significant to this particular study.

These 47 configurations were considered a suf-

TABLE I

THE FREQUENCY COUNT OF 558 TONAL CONFIGURATIONS

Frequency Range	Number of Configurations	Percent of Total Count	Combined Frequency	Percent of Total Frequency
44-213	22	3.94	1939	42.38
20- 43	25	4.48	646	14.12
10- 19	51	9.14	663	14.49
1- 9	460	82.44	1327	29.01
Totals	558	100.00	4575	100.00

TABLE II

THE 22 MOST FREQUENTLY USED TONAL CONFIGURATIONS AS IDENTIFIED IN THE PRESENT STUDY AND BY SMILEY

Present Study			Smiley's Study		
Configuration	Frequency	% Total Frequency	Configuration	Frequency	% Total Frequency
so do	213	.047	so do	191	.041
mi re do	167	.037	so la so	135	.029
so la so	136	.030	do so	102	.022
mi fa so	115	.025	mi re do	99	.021
do re mi	110	.024	so mi	91	.020
do ti la so	106	.023	mi so	88	.019
do mi so	93	.020	do ti la so	80	.017
so mi do	93	.020	do ti do	73	.016
so fa mi	92	.020	do re do*	72	.016
so mi	90	.020	so mi do	70	.015
mi so	76	.017	do mi so	69	.015
so la ti do	76	.017	fa mi re do	69	.015
do la so	69	.015	do re mi	66	.014
do so	68	.015	mi do	65	.014
do ti do	65	.014	so fa mi	64	.014
so fa mi re do	60	.013	do la so	60	.013
so mi so*	58	.013	so la ti do	59	.013
mi do	58	.012	mi fa so	58	.013
do mi	55	.012	so fa mi re do	58	.013
fa mi re do	54	.012	so la*	53	.011
so do mi*	44	.010	do la*	46	.010
re mi fa*	44	.010	do mi	43	.009
Total	1939	.424	Total	1711	.369

* Configurations not found in companion list.
**The figures in this column are to be interpreted as follows: .047 is 4.7 percent, etc.

TABLE III

FREQUENCY ARRANGEMENT OF 25 TONAL CONFIGURATIONS HAVING A FREQUENCY COUNT OF 20 TO 39

Configuration	Frequency	Configuration	Frequency
do re mi fa so*	39	so mi*	25
do re do	36	so do*	24
do re mi do*	31	so fa re do	23
mi fa mi*	30	fa re*	23
fa mi re*	30	la ti do*	23
do do	29	do la do	22
do ti la*	28	mi so do	22
re mi re do*	27	so la so fa mi	22
do mi do*	27	la so fa mi*	21
mi re mi*	27	so do so	20
do re mi re do*	26	re fa mi re do	20
do so do	26	so fa mi re*	20
mi so mi	25	Total	616

*These items were also identified by Smiley as having a frequency count within this range of 20 to 39.

TABLE IV

DISTRIBUTION OF THE SUBJECTS PARTICIPATING IN PHASE I

	4th Grade		5th Grade		6th Grade		
School	Boys	Girls	Boys	Girls	Boys	Girls	Totals
School A	5	5	5	5	5	6	31
School B	4	5	4	5	5	5	28
School C	5	6	5	4	5	5	30
Total	14	16	14	14	15	16	89

ficient number from which to select test items and any further analysis of the data was unnecessary at this time. The analysis was of considerable value in emphasizing a basic problem which the writer feels needs clarification if music educators are to continue to support the "pattern" approach to music reading. It involves establishing objective, rather than subjective criteria for accurately identifying tonal configurations. Such objective criteria might well be established if the procedures suggested in the research concerned with the photographing of eye-movements were to be applied to the problem. Certainly such an investigation would also need to consider the ways in which the perception of any given tonal configuration might be significantly influenced by the factors of rhythmic structure, the accompanying text of a song line, and the overall movement and direction of the melodic line.

B. Selection of the Sample

The subjects for this study were fourth-, fifth- and sixth-grade pupils selected from three of the twenty-two public elementary schools in Madison, Wisconsin. Limitations of time made it impossible to derive a sample which would be representative of the total population of these three grades, and it was, therefore, decided to select the subjects from three schools, these schools being representative of the overall school system. The criteria for selection were school size, geographic location and socio-economic background of the children. School A is a large school, with an enrollment of 841, located in the east area of the city where pupils are drawn largely from the semi-professional group. School B is a small school, with an enrollment of 478, located in the central area of the city where pupils came from the skilled and semi-skilled group. School C is of medium size, enrolling 660 pupils, and located in the west section of the city in an area largely composed of the professional group.

1. Sample for Phase I—The study is divided into two distinct parts, each utilizing a different sample. Phase I utilized a "normal" population of pupils selected at random from the fourth, fifth and sixth grades of each of three schools and undifferentiated in terms of musical ability. Class lists were secured and an equal number of pupils from each grade in each school were selected at random, with equal numbers of boys and girls. Although more than 100 children were tested in Phase I, usable data was secured for 89 pupils. Table IV shows the distribution by school and by grade.

The data for several subjects was judged unusable because they were unable to make the type of response called for by the test, a singing response to aural and visual stimuli. It was considered unwise to administer the entire test to children for whom there could be little success on any item.

2. Sample for Phase III—Phase II of the study utilized two reasonably well-defined segments of this "normal" population of the three selected schools, pupils identified as those gifted musically and those possessing average musical ability. Subjects were selected from grades four and six for each of these two groups. The initial step taken in the identification of these two groups was to establish criteria which could be followed. There is considerable discussion in professional literature regarding the gifted child, but there exist few criteria for identification in the field of music. Usually such judgments are made on the basis of one or more of the following: a) excellence in musical performance; b) demonstrated knowledge of musical information and concepts as measured by achievement tests; c) results of music aptitude or talent tests; d) grades in music subjects; and e) rating scales constructed for the purpose.

The schools participating in this study do not follow a standard testing program to establish levels of musical achievement and there was no readily available data which could be used for identifying possible gifted children. A preliminary investigation of available professional literature had failed to yield many concrete suggestions regarding procedures which could be used to identify musically gifted children other than the criteria which have already been mentioned. Each school had an experienced special music teacher, and it was felt that this person would be capable of identifying gifted pupils if certain criteria were made available. Consequently, a rating sheet was designed by the writer and included twelve items considered by music educators as important factors in determining musical accomplishment of elementary school pupils. (See next page for rating scale.) The rating scale was submitted to a group of music teachers for comments and suggestions and a final form was drafted. The music specialist in each school was then asked to evaluate all fourth- and sixth-grade pupils, the rating sheets were then scored and tabulated. Obtaining evaluations for all pupils made it possible to identify for each grade in each school, three groups of pupils: a) those receiving the highest scores; b) those receiving the lowest scores; and c) those in the middle of the distribution. This procedure led to a more accurate identification of the "average" group since it could be assumed that they were to be found between the upper and lower groups. For each grade in each school the upper ten percent of the total distribution was tentatively selected as being musically gifted. The mean rating score and standard deviation was calculated for each grade in each school and the "average" group was tentatively defined as being within the limits of one-half a standard deviation on

PUPIL RATING SCALE

_____ (Name) _____ (School) _____ (Grade)

(Instructions: Please check the response which best describes the pupil's ability or attitude in terms of his performance on each item.)

A. GENERAL SINGING ABILITY

1. The pupil is able to match individual tones and intervals:
   _____Always
   _____Usually
   _____Occasionally
   _____Seldom
   _____Never

2. The pupil is able to sing a phrase of a song he knows:
   _____But never succeeds, even with help from the piano or teacher
   _____Seldom succeeds, even with help
   _____Needs frequent help
   _____With only occasional help
   _____Independently, with no help

3. In the independent (solo) singing of a song learned by the class, the pupil:
   _____Sings the complete song without help from the teacher or piano
   _____Sings the complete song but needs occasional help
   _____Sings the complete song but needs frequent help
   _____Is seldom able to sing the complete song, even with help
   _____Is never able to sing the complete song, even with help

4. In the independent (solo) singing of a song learned by the class, the pupil:
   _____Almost never sings in tune, usually fails to adjust the pitch when helped
   _____Seldom sings in tune, occasionally is able to adjust the pitch with help
   _____Frequently sings out-of-tune, usually adjusts when given help
   _____Occasionally sings out-of-tune but always adjusts when helped
   _____Almost always maintains correct intonation throughout without help

5. In the independent singing of a song learned by the class, the pupil:
   _____Never makes interval errors, never loses the tonality or key-sense
   _____May make occasional interval errors but regains tonality without help
   _____Makes interval errors and needs help to return to proper tonality
   _____Frequently loses the tonality and does not always respond to help
   _____Almost always loses the tonality and usually fails to respond to help

6. The pupil's singing, either alone or with the class, is characterized by an enthusiastic, eager, whole-hearted and controlled response:
   _____Almost never (0-20% of the time)
   _____Occasionally (21-40% of the time)
   _____Frequently (41-60% of the time)
   _____Usually (61-80% of the time)
   _____Always (81-100% of the time)

B. RHYTHMIC RESPONSIVENESS

7. The pupil, when asked to identify the underlying beat or meter of the song by hearing it, does so immediately and accurately:
   _____Always
   _____Usually
   _____Occasionally
   _____Seldom
   _____Never

8. The pupil, when asked to repeat common rhythmic patterns which he hears, does immediately and accurately:
   _____Never
   _____Seldom
   _____Occasionally
   _____Usually
   _____Always

C. MUSICAL KNOWLEDGES AND SKILLS

9. When participating in appropriate music reading activities, the pupil's response shows that he is:
   _____A leader, capable of much independent music reading
   _____Partially independent, voice always moves in direction of notes and is frequently accurate
   _____Occasionally able to control the direction of the voice by using notes
   _____Seldom is able to react to the notation, learns by rote most of the time
   _____Seems to be unaware of the meaning of the notation, cannot differentiate one symbol from another

10. The pupil demonstrates a knowledge of common musical symbols and terms used in his grade that is:
    _____Poor
    _____Fair
    _____Average
    _____Good
    _____Superior

D. GENERAL INTEREST IN MUSICAL ACTIVITIES

11. In terms of the singing activities carried on, the pupil is:
    _____Very interested and responsive
    _____Usually interested and fairly responsive
    _____Passive, does not put forth much effort but does not resist
    _____Slightly negative, frequently does not participate at all
    _____Has a strong negative reaction, usually does not participate

12. In terms of the listening and creative activities carried on, the pupil is:
    _____Strongly negative, fails to pay attention or show interest
    _____Slightly negative, frequently does not show interest
    _____Passive, shows neither a negative or positive reaction
    _____Is usually very interested and fairly responsive
    _____Very interested and responsive

either side of the mean. The ratings for each school were kept separate since it obviously could not be assumed that all three teachers would interpret the criteria in the same way.

In addition to the teacher ratings, a second criterion measure was used to identify the musically gifted. The Kwalwasser Music Talent Test, Form B, was administered to all fourth- and sixth-grade pupils in the three schools. The decision to administer this particular test was based on the practical necessity of having a standardized talent test which could be given within a single twenty-five minute period, the length of the music period in the schools. The test was administered to 438 pupils and the data is summarized in Table V. The mean score for each sixth grade is slightly higher than the mean score for each fourth grade, but it was not considered necessary to test for the significance of the difference at this time. For the combined grades in the three schools, with a total N of 438, the range of scores was 13 to 40 and the mean was 28.21.

A comparison of the data obtained from the teacher ratings and the Kwalwasser test showed that a relatively low correlation existed between the two criterion measures. Combining all pupils in both grades in each school and calculating the coefficient of correlation for each school showed the following: a) School A, $r = .34$; b) School B, $r = .39$; c) School C, $r = .34$. In the absence of

TABLE V

SUMMARY OF THE SCORES EARNED ON THE KWALWASSER TEST BY 438 4TH AND 6TH GRADE PUPILS IN THREE SCHOOLS*

	4th Grade			6th Grade		
School	Number	Score Range	Mean	Number	Score Range	Mean
A	94	19-36	26.88	108	13-37	28.73
B	70	19-35	27.50	50	21-40	28.58
C	54	20-36	28.37	62	17-37	29.66
Total	218	19-36	27.45	220	13-40	28.96

*The highest possible score is 40.

TABLE VI

REPRESENTATIVE SAMPLE OF PUPILS INITIALLY SELECTED FOR THE TESTING PROGRAM OF PHASE II

School	Total Subjects	Percent of Sample	4th Grade		6th Grade	
			Average	Gifted	Average	Gifted
A	66	44	20	10	21	15
B	38	25	15	7	8	8
C	47	31	14	10	13	10
Total	151	100	49	27	42	33

other information, one may conclude either that teacher ratings provide a more valid way of determining musical giftedness than do talent tests, or that the reverse is a more appropriate conclusion. The writer decided to consider this aspect of the problem in more detail after the data had been collected for Phases I and II. Judgments regarding those pupils who were to be classified as musically gifted were made on the basis of arbitrarily assigning equal weight to both the teacher ratings and the Kwalwasser test scores and then selecting pupils who ranked highest on both measures.

The sample for Phase II was selected on the basis of proportionate representation in terms of each school and each grade. The data showed a total of 475 fourth- and sixth-grade pupils in the three schools with School A accounting for 44 percent of the total; School B for 25 percent of the total; and School C for 31 percent of the total. These proportions were maintained in the sample and, for each school, the proportionate number of pupils enrolled in the fourth and sixth grade was also maintained. An arbitrary total of 151 subjects was established as the maximum number that could be tested within the time limits of the study. The number of gifted pupils identified by the two criterion measures was then subtracted from the total number allocated to each grade in each school and the remainder constituted the number of average pupils. These were to be selected at random from the total distribution within the limits of one-half a standard deviation on either side of the mean. Additional subjects were selected in order to insure the availability of alternates in the event a selected subject was unable to participate in the testing program. Table VI shows the number of average and gifted pupils initially selected for Phase II of the study.

C. Testing Procedures: Phase I

Several exploratory testing sessions had vided valuable information necessary for establishing the testing procedures to be followed in the study. These will not be discussed in the report but are mentioned so the reader is aware that certain procedural decisions which were made were based upon actual test situations and were not the arbitrary decisions of the writer.

The original test contained twenty items of varying length and complexity, selected on the basis of the analysis of song materials discussed in Section IIIA. It was found that three trials of this test took too much time, and so the final form of the test was reduced to three trials of ten items. It was assumed that several trials of the same items would provide data of greater significance than would a single trial of many different items. Three-, four-, five-, and six-note items were used representing ascending and descending scale and chord patterns, either presented separately or in combinations. The construction of these test items utilized some of the suggestions of Ortmann, who was interested in defining and measuring tonal memory in music (5, 6). The items were written as quarter notes with no measure bars or time signature indicated. All items were written in the same key to reduce the number of variables in the testing situation, with the key of E♭ major considered to be most appropriate since it would keep the items within a reasonable singing range for the children. Three complete sets of 4 by 6 test cards were used with the notation on the cards duplicating, as closely as possible, the printed notation in books in order to make for easier reading. The staff contained lines spaced 1/8 inch apart which were placed in the center of the card, the length of the staff being varied according to the number of notes in the test item. The note heads were oval shaped with a lengthwise diameter of 1/8 inch and were spaced 3/8 inch apart. The treble clef sign, flats, and quarter note stems were also of suitable size. No subject reported difficulty in reading the notation, so it may be assumed that the visual stimuli were satisfactorily notated. One trial of this test is shown in Figure 1 at the top of the next page.

A second problem was concerned with the manner in which the tonality and starting pitch was to be established for each configuration. Three methods were considered: a) to sound the pitch of the starting note of each configuration; b) to sound the tonic chord of E flat major, followed by the pitch of the starting tone; or c) to sound only the key-tone E flat, or do, and let the subject locate the starting tone of the configuration from this. The literature shows that each of these methods has been used in similar testing situations, with the third method considered to be the most discriminating in terms of reading ability. This calls for knowledge of not only basic music notation but requires the subject to establish the tonal relationships internally before singing. The exploratory testing sessions established the first method as most appropriate for the study.

A third problem was concerned with the method used in presenting the items in the testing situation. The duration of the exposure time, while not a critical point in the study, needed to be uniform from individual to individual if the data were to be adequately interpreted. A memory drum with a six-second exposure time was used initially but the results showed the exposure to be too brief for an adequate reading response. Therefore, a tape recording of the entire test was made, synchronized with the individual test items which had been placed on cards. The piano was used in preference to some other medium because the children could be expected to be familiar with its sound. The timing of the tape was accomplished by setting an electric metronome so it marked every second, with the flashing light being used rather

FIGURE 1

THE 10-ITEM TEST FOR PHASE I

than the clicks to keep the tape free of unnecessary sounds.

The examiner gave the verbal cue for handing the stimulus card to the subject by saying "Card number ___" within a two-second interval. The starting pitch was sounded on the third second and sustained for two seconds. This was followed by an interval of silence during which time the subject was to sing a response to the visual presentation. A second time interval then followed which included first playing the configuration at a rate of two quarter notes per second, followed by silence during which the subject was to sing what had been played. The beginning of each item was always the same "Card number*___, (**sound pitch)," the "*" occurring each second. The varying time intervals are shown below:

Length of Item	Duration for 1st Interval of Silence	Duration of 2nd Time Interval
3 notes	8 seconds	5 seconds
4 notes	9 seconds	6 seconds
5 notes	10 seconds	7 seconds
6 notes	11 seconds	8 seconds

The subjects for Phase I of the study were selected at random from grades four, five, and six as previously described. All subjects were tested individually in a room other than a classroom. Prior to taking the test, each subject was given a brief orientation which included a statement of the purpose of the experiment together with descriptions of the function of the equipment and of the tasks to be performed. The first trial of the 10-item test included a five-item practice trial which utilized the regular test procedures and gave the subject an opportunity to ask questions about anything that was not understood. Considerable emphasis was given to the idea that hearing an item after the subject had tried to read it was designed to make it possible for the subject to recall the sound of the item the next time it was presented visually, as well as to provide a model against which he could compare the original attempt. The pupil's responses were recorded on a second tape recorder at a tape speed of 3.75 inches per second, a procedure which insured the accuracy of processing and scoring the responses.

The testing procedures for Phase I may be summarized as follows:

1. The subject was given a visual presentation of the first item, accompanied by the starting pitch of the group.
2. The subject then sang an immediate response to this visual presentation, reading the notes of the configuration.
3. This reading trial was followed by a second visual presentation of the item in combination with an aural presentation of the same item. This permitted the subject to associate the sound of the item with its visual representation as well as to provide a model against which he could compare his original attempt.
4. Immediately after this aural presentation, the subject sang what was heard, continuing to look at the notation of the item.
5. The subject then proceeded to the next item, following Steps 1, 2, 3, and 4. The testing continued in this manner until all the items had been presented.
6. The total list of items was presented a second and third time, with the items randomized for each successive presentation to eliminate the possibility of rote or serial learning.

Processing the data presented no significant problems. The tapes contained all the responses of the subjects, and these responses were transferred to individual data sheets for each subject. Correct responses for both the visual and aural stimulus were indicated by a check mark; failure to try an item or to sing only the initial notes of the item were indicated by a dash; incorrect responses, even if only a single tone was wrong, were indicated by the tonic sol-fa syllables for the entire response. Items sung out-of-tune, either in part or completely, were counted as incorrect and the exact pitch reproduction so indicated. For both the visual and aural responses, the scor-

ing system used was the number of items for which correct responses were made in two of the three trials.

D. Testing Procedures: Phase II

Two kinds of learning situations were constructed which differed in sequence of tasks rather than in content. These will be designated as Sequence A and Sequence B. Each sequence contained two tasks and the subject was given approximately 15 minutes to complete each task. In both sequences the two tasks were separated by a 48-hour time interval. This time interval between tasks was used for two reasons: a) the results of the testing in Phase I indicated that children of this age group were not able to give concentrated attention to tasks of this nature for sessions lasting much longer than 15 minutes; and b) the testing was to be done during the time the child met with the regular music class, these classes being scheduled on alternate days rather than daily.

These two sequences, together with their tasks may be diagrammed as follows:

	Task I	Task II
Sequence A	The subject attempts to learn five tonal configurations in eight trials following the procedures established in Phase I.	The subject attempts to learn a short song constructed from the five separate items presented in Task I.
Sequence B	The subject attempts to learn the short song constructed from the five test items.	The subject attempts to learn the five tonal configurations which had been presented in the song.

The material used in both sequences was the same and the testing procedures followed in each task were similar for both sequences. The major difference between the sequences was the order in which the tasks were presented to the subject.

Persons familiar with the procedures recommended in developing music reading skill will recognize that Sequence A is based on the assumption that preliminary learning of certain tonal configurations will result in more rapid learning of a song containing these configurations. Sequence B is based on the assumption that music reading skill should begin with the song and then proceed to the drill work on the musical elements contained in the song. The original design of the study included a second short song to be learned by all subjects in both sequences which would have provided much valuable data regarding the relative merits of each sequence. Unfortunately, there was not sufficient time to do the additional testing.

It was hoped that most subjects would be able to learn the test material in a single testing session. Since it could be assumed that more trials on fewer items would result in a higher percentage of success than fewer trials on more items, it was decided to use a test of five tonal configurations. Item analysis of the data on the visual responses to the items in Phase I resulted in the selection of the five items shown in Figure 2 (top of next page). The data for this item analysis will not be presented in the report since it is not considered pertinent. The techniques employed in making the item analysis were suggested by Flanagan (3).

Since the tonal configurations were again to be presented as quarter notes without time signatures or measure bars, the song to be used should not contain significantly different notations. It was decided to write a song rather than attempt to find one in song-texts which could serve the purpose. These guides were used in constructing the song:

1. It should be reasonably musical without duplicating any familiar songs.
2. Two phrases, each containing four measures, was considered an ideal length.
3. No material other than the five tonal configurations already selected was to be included. This would, however, permit the repetition of at least one tonal configuration or of single tones.
4. Notation was to use only quarter and half notes, with each tonal configuration appearing as a single measure whenever rhythmically possible.
5. The song would be in the same key as the tonal configurations and would encompass a reasonable singing range.

Ten different songs were constructed and submitted to an informal jury of composition students, theory teachers and public school music teachers for reactions and comments. There was considerable agreement that two of the ten songs were musically more interesting than the others and the test song was then selected by tossing a coin. This song, with the tonal configurations identified, is presented in Figure 3.

The subjects for Phase II of the study were selected as described earlier in the report. Each of the three schools had four groups of subjects:

FIGURE 2

THE 5-ITEM TEST FOR PHASE II

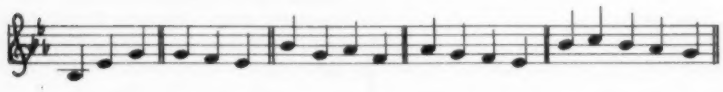
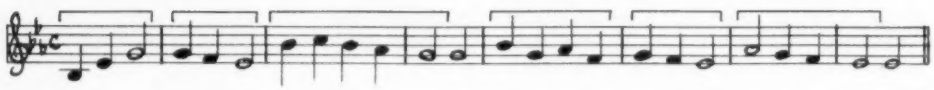


FIGURE 3

THE SONG FOR PHASE II



a) fourth grade, average; b) fourth grade, gifted; c) sixth grade, average; and d) sixth grade, gifted. The subjects within each of these four groups were then assigned at random to either Sequence A or Sequence B, an attempt being made to have equal numbers of subjects in each of the subgroups. This assignment to sequences gave eight groups for each school as shown in Table VII.

Each subject was tested individually, as in Phase I, and the testing consisted of two 15-minute sessions separated by a 48-hour time interval. Before the testing started, each subject was given a brief orientation comparable to the orientation used in Phase I. Subjects in Sequence A were told that during the first session they would try to learn to read five tone groups, or "musical words," and that in two days they would try to learn to read a song which used the same tone groups. Subjects in Sequence B were told that during the first session they would try to learn to read a song and that two days later they were to learn to read five tone groups, or "musical words" which had been used in the song. The orientation also included a short practice session in reading either four tonal configurations or two measures of a song, depending upon the sequence the subject was following.

The procedures for the two tasks were the same regardless of the sequence being followed. The process for learning the five items was identical with the process followed in Phase I and described in detail earlier. There were eight trials of the five items, with the first trial considered as a pre-test, and the items randomized for each successive presentation. Learning the song followed the procedures outlined below:

1. The subject, with the notation of the song before him is given the pitch of the first note of the song and asked to sing as much of it as possible. This served as a pre-test and was used as a basis for determining the amount of learning which took place during the testing.
2. This trial performance was followed by having the subject listen to a performance of the entire song, played at a rate of two quarter notes per second. During the listening the subject was encouraged to follow the notation and, if desired, to sing along with the piano.
3. Following this listening, the subject was asked to sing through the song a second time.
4. Steps 1 and 2 were repeated until the subject had had an opportunity to complete at least eight trials of the song, a trial being defined to include both the singing and listening aspects.

The reader may infer, from these procedures, that a process of rote learning might well be taking place rather than a process of learning to read the notation of the song. To ascertain whether this actually occurred, a check was made of every fourth subject tested. At the conclusion of the testing session, the notation of the song was removed and the subject asked to sing the song from memory. Only a very few subjects were able to proceed as far as the end of the fourth measure; none were able to sing farther than that point; and most subjects were unable to sing more than the first measure and part of the second. These same subjects were, however, able to proceed much farther when using the notation and so it appears reasonable to assume that actual reading rather than rote learning was resulting from the testing.

One significant difference existed between the

TABLE VII

THE INITIAL ASSIGNMENT OF THE 151 SUBJECTS PARTICIPATING IN PHASE II

	4th Grade				6th Grade				
	Sequence "A"		Sequence "B"		Sequence "A"		Sequence "B"		
	Average	Gifted	Average	Gifted	Average	Gifted	Average	Gifted	Totals
School A	10	5	10	5	11	8	10	7	66
School B	7	4	8	3	4	4	4	4	38
School C	7	5	7	5	7	6	5	5	47
Totals	24	14	25	13	22	18	19	16	151

TABLE VIII

THE MEAN SCORES FOR THE VISUAL PART OF PHASE I FOR EACH GRADE IN EACH SCHOOL

	4th Grade		5th Grade		6th Grade		Combined Grades	
School	N	Mean	N	Mean	N	Mean	N	Mean
A	10	4.2	10	4.9	11	4.36	31	4.5
B	9	2.9	9	2.3	10	4.1	28	3.1
C	11	3.5	9	4.9	10	5.1	30	4.4
Total	30	3.53	28	4.07	31	4.52	89	4.0

procedures followed in learning the patterns and in learning the song; each pattern was presented individually for both the reading and listening attempts while the song was always presented as a complete entity. In order to minimize this difference, the writer decided that following each reading trial of the song, and prior to the subsequent listening, the reading errors made by the subject would be pointed out and verbally described by the examiner. This decision was based on the analysis of the data from Phase I which showed that many subjects persisted in making the same errors because of an inability to retain the sound of their reading attempt as a basis for comparison with the item when it was played for them. If this held true for items treated individually, it would be more true when the subject was expected to retain the aural memory of an eight-measure song. It was also felt that this assistance resulted in a better attitude on the part of the subjects because they were able to achieve better performances.

For both tasks a criterion of success had been established which consisted of two consecutive perfect performances, or trials, of the task. There seemed no valid reason to continue through all eight trials with subjects who could perform the task after two or three trials.

The equipment used in the test situations was the same as for Phase I and included: a) two tape-recorders; b) one set of test cards for the five items, there being sufficient time to re-arrange them for the next trial; and c) one 5 × 8 index card containing the song, with the notation the same size as used in Phase I. The master tape for the five items was made according to the procedures outlined for the master tape in Phase I; the master tape for the song contained ten successive performances of the song, although eight had been considered sufficient.

Processing the data was carried forward in the same way as for Phase I. The data for both the patterns and the song were transferred to the individual data sheets and scores, in terms of correct responses, were calculated for each subject. Three kinds of scores were used:

1. A "percent correct" score was calculated for each item in the five-item test and for each item in the song, the item being defined as the tonal configuration:

$$\text{"Percent correct"} = \frac{\text{Number of trials item correct}}{\text{Total number of trials}}$$

2. A "mean percent correct" score was calculated for each task. This was a simple mean score:

$$\text{"Mean percent correct"} = \frac{\text{Sum of the "\% correct scores" on each item"}}{\text{Number of items in task}}$$

For both of these scores the unit which served as the basis of the score was the individual item. The first trial was not included in the total number of trials, as explained later.

3. A "rate of learning" score was calculated for each task and represented an attempt to locate a single score which could describe the true net gains made on the task and, at the same time, take into consideration the number of trials needed to make those gains. The formula used for this "RL score" was:

$$RL = \text{true net gain} \times \frac{100}{\text{Total N of trials}-1}$$

The true net gain can be expressed as $\frac{a-b}{c-b}$

in which:

a = Score on final trial, the final trial identified as the first of the two consecutively perfect trials.

b = Score on first trial.

c = Perfect score, the score assigned to any trial in which all items are correct.

The actual gain made by a subject is expressed in the numerator, "a-b;" the total gain possible for the subject is expressed in the denominator, "c-b." The result, which can never exceed 1, is the true net gain.

Since this true net gain does not reflect the number of learning trials taken by the subject, the second part of the formula was used. The numerator, 100, is used so the score may be expressed in larger units. The denominator indicates the actual number of trials during which learning could take place. The first trial for both tasks was considered a pre-test of previous knowledge, since it was assumed that learning the content of the task did not begin until the subject had heard that content. In the case of the song, this occurred after the initial trial; in the case of the tonal configurations, this occurred during the first complete trial but always after the individual item had been attempted. Therefore, this first trial was subtracted from the total number of trials, keeping in mind the definition of the final trial, to give the number of learning trials the subject had.

In Phase I the scoring of the items was done on a "right" or "wrong" basis. It was decided, in view of the nature of the tasks, to use a third alternative for scoring the items in Phase II. This involved giving credit for one-half a correct response if the subject sang the item at the wrong pitch level but retained the same pattern and relative pitches of the original item. For example, if the subject, in reading the item "fa-mi-re-do," did not correctly locate the starting pitch and sang "sol-fa-mi-re" instead, he was given credit for

one-half a correct response. This scoring procedure gave data which more accurately described the music reading abilities of the subject since he was not penalized for his inability to sing independently. There are a great many pupils in the elementary grades who can read and interpret music symbols with a high degree of accuracy but who need the support of an accompanying instrument to maintain perfect tonality and intonation. The writer did not, in this exploratory study, wish to discriminate against the child for whom the task was already very difficult.

In order to illustrate the entire scoring procedure, a sample data sheet used for scoring the song is given in Figure 4, and the three scores are indicated as well as the process of deriving the scores. The tonal configurations appearing in the song are indicated with brackets, and the individual notes outside the bracket in measures 4 and 8 are not included in the scoring. A value of eight points is given for each correct tonal configuration yielding a total perfect score of 48 for the six items.

IV. Results of the Study

A. Phase I: Visual

Usable data was obtained for 89 of the more than 100 pupils tested in Phase I. Since the subjects had been selected at random from the total fourth-, fifth-, and sixth-grade population in each school, it was highly possible that some subjects would be tested whose data would not be usable. Such subjects would include the following:

1. Pupils who verbally expressed no desire to be tested;
2. Pupils who were unable to match pitches and consequently would not be able to make any singing response to either the visual or aural stimulus;
3. Pupils whose ability to repeat what they heard was so poor that they were unable to sing more than two correct responses out of the ten items;
4. Pupils who became so nervous during the testing that they were unable to continue.

In discussing the data, the term "visual" will be used to refer to the responses made to the visual presentation of the items—the reading aspect of the test. The term "aural" will be used to refer to the responses made to the aural presentation of the items—the listening aspect of the test.

The data for pupils in each grade in each school were first tabulated to ascertain the kinds of scores which had been made. The basis of scoring was to count an item correct if a correct response had been made for any two of the three trials. An item was scored wrong if it was incorrectly sung or if no trial or only a partial trial was made of the item. The score was the sum of the individual items correct, with a maximum score of 10. Table VIII summarizes the mean scores for each grade in each school.

The data shows the mean score for the fourth grade to be lower in each school than the mean scores for the two upper grades. The same difference appears when the three schools are combined by grade level. The data also shows the mean score for the sixth grade to be higher than the mean score for the fifth grade in Schools B and C, but not in School A. When the three schools are combined, however, there is a steady increase in the size of the mean from fourth grade through sixth grade.

A test for the significance of the difference between the mean scores of each grade, combining the three schools, gave $F = 1.5068$, and it may be concluded that there is no significant difference between the three grades in terms of the data of Phase I (Table IX). The five percent level of significance is used throughout the study. This, of course, has significant implications if intensive testing at these levels continued to support these findings. A test for the significance of the differences between the scores for the fourth and sixth grades, the grades to be studied in Phase II, gave a "t"* of 1.8397 and the differences were considered as not significant.

Table VIII also shows the mean scores for each grade to vary from school to school. For the fourth grade, School A had the highest mean, with schools C and B in descending order. For the fifth grade Schools A and C had identical means, and for the sixth grade School C had the higher mean, with schools A and C in descending order. This would appear to indicate that subjects in each grade in School B consistently performed at a lower level of achievement than subjects from the other two schools. The mean scores for the combined grades in each school shows Schools A and C to have overall means which are very similar

*Calculation of "t" used the following formula:

$$\text{"t"} = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\left(\frac{\Sigma x_1^2 + \Sigma x_2^2}{N_1 + N_2 - 2}\right)\left(\frac{1}{N_1} + \frac{1}{N_2}\right)}} \qquad \text{in which } \Sigma x^2 = \frac{1}{N}\left[N\Sigma X^2 - (\Sigma X)^2\right]$$

FIGURE 4

SAMPLE DATA SHEET, PHASE II, SONG

Mary Jones (Name) | A (Sequence) | Gifted (Group) | A-6 (School and Grade)

	Item 1	Item 2[3]	Item 5		Item 3	Item 2[3]	Item 4		
	1	2	3	4	5	6	7	8	
	S D M	M R D	S L S F	M M	S M F R	M R D	F M R	D D	
1	√	m d s	s s m d	d d	r t r t	r t s	m r d	s s	8
2	√	m d s	s l s m	d d	r d r t	r t s	s f m[1]	r d	12
3	√	√	√	√	√	s m d	s f m[1]	r d	36
4	√	√	√	√	√	s m d	s f m[1]	r d	36
5	√	√	√	√	√	√	f m d	d d	40
6[2]	√	√	√	√	√	√	√	√	48
7	√	√	√	√	√	√	√	√	
8									
*	5/5=100%	4/5=80%	4/5=80%		4/5=80%	2/5=40%	2. 5/=50%		

[1] Item is counted as half correct and given 4 points because the intervallic relationship is correct even though the pitches are incorrect.
[2] Identified as final trial because it is the first of two consecutively perfect trials.
[3] This item is repeated and accounts for the six items of the task.
*Percent correct score for each item.

Mean percent score = $\frac{100+80+80+80+40+50}{6}$

$= \frac{430}{6} = 71.6$

RL Score = $\frac{48-8}{48-8} \times \frac{100}{5} = \frac{40}{40} \times \frac{100}{5} = 20$

TABLE IX

ANALYSIS OF VARIANCE BETWEEN GRADES FOR THE VISUAL PART OF PHASE I

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square
Total	435.8202	88	
Grades	14.7545	2	7.3773
Pupils in Grades	421.0657	86	4.8961
			(F = 1.5068)

See "Distribution of F" in Palmer O. Johnson's Statistical Methods in Research (New York: Prentice-Hall, 1949), pp. 362-65.

TABLE X

ANALYSIS OF VARIANCE BETWEEN SCHOOLS FOR THE VISUAL PART OF PHASE I

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square
Total	435.8202	88	
Schools	33.2830	2	16.6415
Pupils in Schools	402.5372	86	4.6807
			(F = 3.5553)

and, at the same time, more than one point higher than the mean for School B. Analysis of variance yielded an F = 3.5553 which is significant at the five percent level and one may say that a significant difference exists between the three schools.

Further analysis of the data showed the following:

1. There is no significant difference between the mean scores for the combined grades of School A and School C; "t" = .0907.
2. There is a significant difference between the mean scores of School A and School B; "t" = 2.394.
3. There is a significant difference between the mean scores of School C and School B; "t" = 2.2249.

This analysis shows that the subjects from School B did not perform at as high a level as did the subjects from either of the other two schools. In order to accurately identify the reasons for this difference, it would be necessary to consider such factors as: a) the socio-economic background of the subjects; b) the nature of the music program in this school as compared to the other schools; c) the music teacher; and d) the musical interests and music training of the subjects as compared to subjects in other schools.

Examination of the rating sheets completed by the music teacher showed that pupils who were placed in the lowest group in terms of musical ability were always the boys. Not a single girl received so low a rating. The professional literature contains numerous articles dealing with the "boy problem" in music activities at the various grade levels. There is, however, nothing to suggest that the objectives of the music program differentiates between boys and girls and there is no information to indicate that girls possess more native musical ability than do the boys. The conclusion which must be reached is that the girls have a different attitude toward music which makes for better achievement, more interest, and consequently for higher teacher ratings.

The subjects for Phase I had been selected in such a way so as to secure equal numbers of boys and girls at each grade in each school. A summary of the results on the visual part of the test is given in Table XI. This shows the following:

1. For School A, the boys earned higher scores than the girls in both the fourth and sixth grade and these scores were very close together in fifth grade. When the scores for three grades were combined, the boys had a higher mean than did the girls.
2. For School B, the girls earned higher scores than the boys in both the fourth and sixth grades. When the scores for the three grades were combined the girls had a higher mean than did the boys.
3. For School C, the girls consistently did better than the boys.
4. For the three schools combined, only the fourth grade showed little difference between the boys and the girls.
5. For the combined grades in the combined schools, the boys had a mean of 3.67 and the girls had a mean of 4.39.

The "t" test of significance gave a "t" of 1.5457 and it may be concluded that there is no significant difference between the mean scores of the boys and girls when all grades and all schools are combined.

1. Analysis of Reading Errors—A considerable amount of time was spent in making a detailed analysis of the reading errors made on each of the ten items of the test. The purposes of the analysis were: a) to identify any common errors which occurred; b) to attempt to identify the progress shown by the subject for the three trials; and c) to provide necessary data for the item-analysis. The data for the item analysis has been briefly presented. The data regarding the progress of individual pupils is not considered pertinent to the report, and so only the analysis of reading errors will be discussed at this time.

In making this analysis the responses to each item were considered separately for each trial so that a perfect score on all ten items was 30. Multiplying 30 by the number of subjects tested yields the total number of responses possible. Three types of responses were considered: a) right; b) wrong; and c) no trial. A "no trial" response consisted either of no attempt to sing a response to the visual stimulus or failure to reproduce more than one or two notes of the item. Table XII summarizes the responses made by the 89 subjects to each item on the test. The reader is asked to refer to Figure 1 for the notation of these items. Inspection of the totals and means in the table shows the following:

1. Fourth-grade pupils had twice as many "no trial" responses as either of the other two grades. Fifth and sixth grade "no trial" responses are very similar.
2. The mean number of "wrong" responses for sixth grade is slightly lower than that of the other two grades.
3. The mean "right" responses shows improvement from grade to grade although the differences are not statistically significant as was emphasized earlier.
4. The mean "wrong" responses for all grades exceeds the mean "right" responses.
5. Items 2, 3, 4, 7 and 10 had far fewer "right" responses than the other five items on the test.

TABLE XI

THE MEAN SCORES FOR THE 43 BOYS AND 46 GIRLS TESTED IN PHASE I

	4th Grade				5th Grade				6th Grade				Combined			
	Boy		Girl		Boy		Girl		Boy		Girl		Boy		Girl	
School	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
A	5	4.6	5	3.8	5	4.8	5	5	5	4.6	6	4.2	15	4.7	16	4.3
B	4	2.5	5	3.2	4	2.5	5	2.2	5	3.4	5	4.8	13	2.9	15	3.4
C	5	3.2	6	3.7	5	3.0	4	7.3	5	4.0	5	6.2	15	3.4	15	5.5
Totals	14	3.5	16	3.6	14	3.5	14	4.6	15	4.0	16	5.0	43	3.6	46	4.39

TABLE XII

SUMMARY OF THE RESPONSES MADE BY 89 SUBJECTS TO THE VISUAL PART OF PHASE I

	4th Grade				5th Grade				6th Grade				Combined Grades			
Item	N	No Trial	Wrong	Right	N	No Trial	Wrong	Right	N	No Trial	Wrong	Right	N	No Trial	Wrong	Right
1	30	10	32	48	28	3	33	48	31	4	33	56	89	17	98	152
2	30	8	69	13	28	7	62	15	31	4	80	9	89	19	211	37
3	30	15	69	6	28	10	69	5	31	6	80	7	89	31	218	18
4	30	14	62	14	28	4	57	23	31	3	57	33	89	21	176	70
5	30	4	27	59	28	0	31	53	31	4	27	62	89	8	85	174
6	30	6	55	29	28	3	50	31	31	3	47	43	89	12	152	103
7	30	4	63	23	28	3	62	19	31	3	61	29	89	10	186	71
8	30	4	34	52	28	4	29	51	31	2	25	66	89	10	88	169
9	30	4	17	69	28	2	18	64	31	2	23	68	89	8	58	201
10	30	6	63	21	28	1	61	22	31	1	58	34	89	8	182	77
Totals	30	75	491	334	28	37	472	331	31	32	491	407	89	144	1454	1072
Mean		2.5	16.4	11.1		1.3	16.8	11.8		1.0	15.8	13.1		1.6	16.3	12.04

The scope of this report is such that a detailed discussion of all reading errors for each item would prove impractical. The writer proposes, therefore, to present a brief summary of the errors made most frequently by the 89 subjects, using tonic sol-fa syllables for identification. A dash below the syllable indicates that the pitch is lower than the preceeding tone; a dash above indicates that the pitch is higher.

Item 1: (F M R D)

Within the 98 errors made by the combined grades, the following appeared most frequently:

1)	FRTS	10	4)	FS̄L̄F	5
2)	FRTF	5	5)	F̄S̄L̄T̄	5
3)	FRM̄D	5	6)	FMeRD	4
7)	FRDTe	4			
8)	SMDS	5			
9)	SFMR	6			
	Total	49			

The remaining 49 errors had frequency counts of 1 to 3, 25 errors having a frequency count of only 1. It is interesting to note that Error 5 is an exact inversion of the pattern and Error 4 a partial inversion; that errors 1, 2, and 8 are descending chord figures; and that Errors 8 and 9 began on the wrong pitch despite the fact that the actual starting pitch was sounded for two seconds. In fact, 27 of the 98 errors included failure to begin on the correct pitch. The scores for the three grades are very similar although the fourth grade had more "no trial" responses.

Item 2: (D L S)

Within the 211 errors of the combined grades, these appeared most frequently:

1)	DTL	71	4)	DSL	8
2)	DSM	44	5)	DSF	9
3)	DLF	26	6)	DSD	8
7)	DTS	6			
8)	DTeL	4			
	Total	177			

The eight errors account for 177, or 84 percent of the total wrong responses. Of remaining 34 errors, 17 had a frequency of 1, four had a frequency of 2, and three had a frequency of 3. It is interesting to note that Errors 1, 2, and 3 were the most common. Children do not appear to notice the interval of the minor third followed by the major second since they sing the pattern either as a partial scale or as a complete chord figure. There were only 37 correct responses out of a possible total of 267. It is of interest to note that the sixth grade had more "wrong" responses and fewer "right" responses on this item than either of the other two grades. Only 17 errors were caused by failure to start on the correct pitch.

Item 3: (S M D R̄ T D̄)

The errors appearing most frequently in the total of 218 were:

1)	SMDM̄DM̄	14	4)	SFMF̄RM̄	10
2)	SFMF̄MR	13	5)	SFMRDT	7
3)	SFMS̄FM	13	6)	SFMF̄S̄F	6
7)	SMDR̄S̄D̄	6			
8)	SMDM̄RD	5			
9)	SMDM̄S̄D̄	5			
	Total	79			

These nine errors account for only 79, or 3.6 percent of all errors with most of the remaining 139 having frequency counts of only 1 or 2. This item was the most complex because it included six tones and was very disjunct, and this accounts for the fact that it had the fewest number of correct responses of any item. The same held true for the aural responses to the item; it again had the lowest number of correct responses.

Errors 1, 7, 8 and 9 show a partially correct response being made, presumably because the first part of the pattern was familiar and could be remembered better than the last three notes. Error 5 is a simplification of the pattern so it becomes a scale while the other errors show a tendency to repeat a 3-tone pattern. Failure to begin on the starting pitch accounts for only 32 of the errors.

Item 4: (D S L̄ T̄ D̄)

This item began with a descending interval of a fourth and continued with an ascending scale pattern which returned to the starting tone. The interval is a difficult one to sing and this is evident in the number of errors. The 9 errors most frequently made accounted for 100, or 57 percent of

the total "wrong" responses.

1)	DTLSF	32	4)	DDRMF	13
2)	DTLTD	19	5)	DMFSL	8
3)	DLTDR	16	6)	DLSFM	7
	7)	DFSLT	5		
		Total	100		

Errors 1 and 2 completely ignore the beginning interval in the item either because it was not perceived or because the subjects were unable to produce any interval larger than a second. Error 6 under estimates the size of the beginning interval but does acknowledge its presence, and then ignores the ascending scale and transforms it into a descending scale. The remaining errors all show recognition of the general shape of the item, a skip down followed by an ascending scale, but fail to get the interval correct. This characteristic was also true for most of the remaining 76 errors which had frequencies of 1, 2 or 3. The sixth grade had considerably more "right" responses to the item than the other two grades. Only 13 errors were the result of an inability to match the starting tone which was given.

Item 5: (DMS)

This is one of the more familiar items on the test, a fact reflected in the large number of "right" responses by all grades. Note the way in which the pupils in the fourth and sixth grades duplicate each others performance. This item had only 85 "wrong" responses, a record exceeded only by item 9, and one error, "DRM" had a frequency of 53, or 62 percent of the total. In fact, there were only 18 different errors counted for this item, the other 17 having frequencies of 1 or 2. The tonic chord is often sung as a 3-note scale while DRM is often sung as the tonic chord. This suggests that subjects do not really read the notation but more often guess at it. A total of 13 errors resulted from failure to begin on the correct pitch.

Item 6: (SLSFM)

This combination of neighboring tones and a partial descending scale was easier for the sixth grade than for fourth and fifth, whose scores are similar. A total of 62 different errors were counted and the 7 most frequently made accounted for 75, or 49 percent of the total number of "wrong" responses. These are:

1)	SLSMD	20	4)	SMFRD	9
2)	SFMRD	15	5)	SLFMR	8
3)	SDSMD	12	6)	SLSFR	6
	7)	SLSMR	5		
		Total	75		

Errors 1, 6 and 7 show a partial success in reading the item, while Error 2 results again from attempting to use a familiar response to notation which is not carefully observed. Errors 3, 4 and 5 represent inaccurate responses which were strongly influenced by the aural presentation of the item in the trial which preceded this particular item. Only 12 errors were identified as failure to begin on the correct note.

Item 7: (SDM)

This item, an inversion of the more familiar item 5, contains within its first two notes one of the most common tone patterns identified in songs. It ranked first in the analysis made by the writer and Smiley's analysis, and is invariably found in songs which have an acrusis, or "pick-up note." Despite this, the fact that it begins with an ascending fourth presents a definite reading problem to children in all the grades. Many children experienced difficulty in singing the first tone because they were unable to relax sufficiently for the note to sound. This difficulty did not appear in the analysis of aural responses to the same item although for the reading response it apparently was a factor since 47, or 25 percent of the total errors were the result of an incorrect beginning pitch. The common errors identified for this item are:

1)	STR	49	5)	STD	8
2)	SLT	36	6)	SRF	6
3)	DRM	10	7)	SLS	5
4)	SLD	9	8)	TRF	4
	9)	LDM	4		
	10)	DMS	4		
		Total	135		

The 10 errors account for 73 percent of the total "wrong" responses and Errors 1 and 2 account

for 46 percent of this same total. The tendency to reduce the interval of a fourth to an interval of a third and proceed to sing a tonic chord is evident in Error 1; the tendency to revert to a scale pattern whenever the reader is in doubt is shown in Error 2.

Item 8: (M R D)

This is one of four items for which the number of "right" responses exceeds the number of "wrong" responses. The fourth- and fifth-grade pupils perform almost the same way, with the sixth grade showing better results. Only 17 of the 88 errors resulted from beginning on the wrong pitch. The familiarity of this pattern is established by the scores. The common errors are:

1)	MDS	24	4)	MDL	5
2)	MF̄S	10	5)	MF̄R	5
3)	SMD	6	6)	SFM	4
				Total	54

These errors account for 61 percent of the total and it is interesting to note the frequency with which this simple scale pattern becomes a descending tonic chord, Error 1 has a frequency of 24, or 27 percent of the total number of errors. The reader is referred to the analysis of Item 5 which shows parallel results.

Item 9: (L S F M R D)

This six-note descending scale proved to be the easiest item of the ten, and all grades appeared to perform with equal ability. There were no errors having a frequency greater than five although a total of 37 different errors were counted. Failure to begin on the starting tone did account for 20, or 35 percent of the total errors made.

Item 10: (S M F̄ R)

The disjunct character of this item made it more difficult than one would expect since a sequence of descending thirds occurs quite often in songs. Again, very little difference exists between the fourth and fifth grades while the sixth grade achieves slightly better scores. A total of 59 different errors were tabulated and all but the four given below had frequency counts of six or less:

1)	SFMR	27	3)	SMF̄D	14
2)	SMS̄M	14	4)	SRM̄D	10
				Total	65

Error 1 again represents this phenomenon of substituting a familiar tonal configuration for an unfamiliar one, possibly the result of carelessness but more often resulting from the subject's inability to "hear" the pattern before it is sung. Only nine errors of the 182 were caused by an incorrect starting pitch.

2. Summary of the Findings—This detailed analysis of reading errors emphasizes several important points. The total of 1454 "wrong" and 144 "no trial" responses as compared with 1072 "right" responses shows that children in the elementary grades experience considerable difficulty in reading tonal configurations which are commonly found in the songs children sing.

1. During the testing period, the writer found that most children read the item very slowly, a single note at a time. This is not apparent in the data because there is no way of indicating this kind of performance other than to listen to the tape-recorded responses.
2. Although children experienced little difficulty in making a response to the aural stimulus they were seemingly unable to "make the voice go the way the notes do," as several subjects pointed out. This implies that skill in reading music can be developed only if the child is able to "hear" the item silently before he sings it. Developing this internal "hearing" presents many problems including an adequate identification of effective teaching procedures.
3. Children are usually aware of the general shape or direction of the tonal configurations but fail to acquire the ability to accurately identify the internal changes which make one pattern different from another even though the two patterns appear quite similar.
4. When children are asked to read tonal configurations which are not immediately recognized as something they know, one of two types of responses generally result: 1) changing the pattern so that it becomes a familiar pattern which is very similar to the stimulus, or 2) just guessing that the response being made is something like the stimulus without having any sound basis upon which to judge the accuracy of their response. The total number of different errors which the children made on the 10 items in evidence of the second kind of response. Excluding the "no trial" responses, 489 different errors were made in accumulating the 1454 "wrong" responses, giving an average frequency of 2.97 per error. Evidence of the first type of response is indicated by the fact that 61, or 12.47 percent of the 489 different errors

had a total frequency count of 787, or 54 percent of the 1454 "wrong" responses.

5. The data from Phase I shows comparatively little difference between grades in terms of general ability to perform the task. Part of this might be due to the fact that three trials of the 10 items did not give the subjects sufficient opportunity to learn the items. The question arises as to whether more trials would have shown significant differences between the three grades. Since most music reading activities begin at the third-grade level, this means that sixth-grade children have two additional years of experience with reading music than do fourth-grade children. If there is no significant difference between the achievement of the two grades, and the data from Phase I shows that this is true in terms of this particular investigation, some highly interesting speculations may be made as to why this is true.

B. Phase I: Aural

Paralleling the analysis of reading errors was an analysis of the errors made by the subjects as they responded to the aural presentation of each of ten items. It is generally agreed by music educators that music reading ability depends a great deal upon developing the ability to perceive music aurally. This "ear vocabulary" of musical sounds establishes the basis for music reading activities, because the child is then able to work with familiar concepts and materials.

The data on the singing responses to the aural presentation of the item was processed in the same way as the data for the visual part of the study. The basis of scoring was again to count an item correct if a correct response had been made for any two of the three trials. An item was counted as wrong if it was incorrectly sung or if no trial or only a partial trial had been made on the item. The score was the sum of the individual items correct, with a maximum of 10. Table XIII summarizes the mean scores for each grade in each school.

The data shows that fourth- and fifth-grade subjects, in each school and for the combined schools, had lower mean scores than the sixth-grade subjects. Only in School B was there a marked difference between the means of fourth- and fith-grade subjects. These results are similar to the results on the visual part of the test in terms of the relative achievement of each grade. The reader may wish to compare these means with the means on the visual part presented in Table VIII. Such a comparison shows that pupils in each grade earned a score on the aural part of the test that was approximately four points higher than the scores for the visual part. In other words, they were able to double their achievement when an imitative, rather than a reading response was required.

A test for the significance of the differences between the mean scores of each grade, combining the three schools, gave $F = 1.6297$ and it may be concluded that there is no significant difference between the three grades in terms of this data (Table XIV).

This may well indicate that the ability to respond to an aural stimulus is already developed by the fourth-grade level and does not change significantly after that time.

Table XIII shows the mean scores for each grade in School A and C to be very similar but that subjects in School B consistently performed at a lower level of achievement, especially when the fifth grades are compared. However, analysis of variance between the schools gave $F = 2.7376$ and it may be concluded that no significant difference exists between the three schools when subjects are asked to respond to an aural stimulus (Table XV).

There is no reason to suspect that boys differ significantly from girls in ability to respond to an aural stimulus except the difference which may be due to the general inclination of the boy to avoid using his singing voice. The combined mean score for the 43 boys tested was 8.023 and for the girls it was 8.587. The "t" test of significance gave "t" = 1.6386 and it may be concluded that there is no significant difference between the mean scores of boys and girls.

These data would tend to support the point-of-view that auditory perception, as measured by a singing response to an aural stimulus, is already developed by the time a child reaches the fourth grade and does not significantly change as a result of the additional musical experiences in the upper elementary grades.

1. Analysis of Singing Errors—A detailed analysis of the singing errors made on each of the ten items was carried forward following the procedures used in making the analysis of reading errors. The reader has observed the fact that the subjects had considerably higher mean scores on the aural part of the test than they did on the visual part. The writer was particularly interested in whether subjects with high scores on the aural part of the test had also obtained high scores on the visual part. The product-moment correlations were computed and resulted in the following:

1. Sixth grade, $r = .64$
2. Fifth grade, $r = .70$
3. Fourth grade, $r = .58$
4. Combined grades, $r = .64$

The writer is unable, at this time, to determine whether these could be considered high, medium, or low correlations in terms of the two skills being considered. It is of interest to note that fifth-

TABLE XIII

THE MEAN SCORES FOR THE AURAL PART OF PHASE I FOR EACH GRADE IN EACH SCHOOL

School	4th		5th		6th		Combined	
	N	Mean	N	Mean	N	Mean	N	Mean
A	10	8.5	10	8.5	11	8.8	31	8.6
B	9	7.8	9	7.0	10	8.4	28	7.8
C	11	8.3	9	8.4	10	8.9	30	8.5
Total	30	8.2	28	8.0	31	8.7	89	8.3

TABLE XIV

ANALYSIS OF VARIANCE BETWEEN GRADES FOR THE AURAL PART OF PHASE I

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square
Total	219.1910	88	
Grades	8.0039	2	4.0020
Pupils in Grades	211.1871	86	2.4557
			(F = 1.6297)

TABLE XV

ANALYSIS OF VARIANCE BETWEEN SCHOOLS FOR THE AURAL PART OF PHASE I

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square
Total	219.1910	88	
Schools	13.1195	2	6.5598
Pupils in Schools	206.0715	86	2.3962
			(F = 2.7376)

grade children are apparently more consistent than children in the other two grades, with the fourth grade not maintaining as high a straight-line "relationship." This is a problem which needs further investigation before any sound conclusions can be drawn.

The data presented in Table XVI summarizes the responses of the 89 subjects, these responses again being considered separately for each trial so that a perfect score on all ten items is 30. The table shows the following:

1. There were very few "no trial" responses, only 16 for the three grades, with the sixth grade having only one.
2. Sixth-grade pupils had fewer "wrong" responses, a mean of 4.1, while fourth and fifth grades had means of 5.67 and 6.1 respectively.
3. The mean "right" responses show the sixth grade to be slightly better than the other two grades.
4. The mean "right" responses for all grades is almost five times greater than the mean "wrong" responses.
5. Only item 3 shows the "wrong" responses to exceed the "right" responses, a result attributed to the length and complexity of the item.

Since the reader may be interested in comparing the visual and aural parts of the test, Table XVII gives a brief summary of the pertinent information. This clearly points out the comparative difficulty of the two aspects of the test.

The writer does not feel that any specific purpose would be served by presenting a detailed, item-by-item analysis of the singing errors made by the subjects. Inspection of the individual data sheets showed that a total of 246 different errors were made in accumulating the 466 "wrong" responses. It will be recalled that analysis of the reading errors for this test gave 61 common errors which had a frequency count of four or more and accounted for 54 percent of the total number of "wrong" responses. For the aural responses, only 22 such common errors were noted and these accounted for 36 percent of the total number of "wrong" responses. One reason for the lack of common errors lies in the difference between the two tasks. For the visual part of the study, with the subject singing the starting pitch immediately after it had been given, failure to begin on the correct pitch accounted for 1.4 percent of the total errors; for the aural part of the study it accounts for 39.3 percent of the total errors. This inability to locate the correct starting pitch for items presented aurally is probably due to the fact that the subject had to retain this pitch during the entire aural presentation, something which many of the pupils were unable to do.

2. Summary of Findings—The analysis of singing errors which has been briefly presented shows that aural imitation of an item is considerably easier for children than making responses to visual stimuli. While 54.5 percent of the responses to the visual presentation of the items were "wrong" responses, only 17.5 percent of the responses to aural presentations were "wrong". This again emphasizes the difference in the difficulty of the two kinds of responses. The "wrong" responses to the aural presentation of the items showed few common errors and this suggests that guessing is taking place. It appears unlikely that music reading skill can be developed by continuing to emphasize rote-learning and imitative singing in the upper grades. The data show that little difference exists between grades in terms of this auditory perception. The major problem centers around the methods used to help the child relate this auditory perception to the visual stimuli so the latter are meaningful.

C. Phase II

Originally 151 subjects had been chosen for this aspect of the study but several of these were not available for testing and so data was secured for 138 fourth- and sixth-grade pupils. Table XVIII shows the distribution of these subjects according to school, grade, and the sequence to which they had been assigned. The procedures for identifying the "average" and "musically gifted" subjects have been described earlier in the report.

Certain additional information was obtained for each subject and included: 1) age, in months, through March 1, 1959; 2) I.Q., as determined by the California Test of Mental Maturity, Form S for Elementary Grades; and 3) the kind of musical instrument played and the length of time it had been studied.

Table XIX summarizes the information regarding age and I.Q., of the subjects, with the figures given being the means for each group in each school. This shows relatively little variation in age for each group in the three schools. There is a greater difference between the means of the various groups in terms of I.Q. The "gifted" group in each grade has a higher mean I.Q., than the "average" group in the same grade and this difference is maintained for each of the three schools. It is of interest to note that the mean I.Q., of subjects in School C is higher than in either of the other two schools, with School A slightly lower than School B. Unfortunately, it has not been possible, within the scope of this study, to ascertain either the significance of the differences or the possible effect I.Q., might have upon the subject's performance in the tests of Phase II. Research on the topic tends to show that a high level of native musical capacity is not necessarily accom-

TABLE XVI

SUMMARY OF THE RESPONSES MADE BY 89 SUBJECTS TO THE AURAL PART OF PHASE I

	4th Grade				5th Grade				6th Grade				Combined Grades			
Item	N	No Trial	Wrong	Right	N	No Trial	Wrong	Right	N	No Trial	Wrong	Right	N	No Trial	Wrong	Right
1	30	0	8	82	28	1	13	70	31	0	5	88	89	1	26	240
2	30	2	8	80	28	1	21	62	31	0	13	80	89	3	42	222
3	30	1	60	29	28	2	55	27	31	0	56	37	89	3	171	93
4	30	1	16	73	28	2	14	68	31	0	10	83	89	3	40	224
5	30	1	6	83	28	1	3	80	31	0	2	91	89	2	11	254
6	30	1	15	74	28	0	17	67	31	1	9	83	89	2	41	224
7	30	0	10	80	28	0	7	77	31	0	9	84	89	0	26	241
8	30	0	4	86	28	0	8	76	31	0	4	89	89	0	16	251
9	30	2	28	60	28	0	25	59	31	0	15	78	89	2	68	197
10	30	0	15	75	28	0	7	77	31	0	3	90	89	0	25	242
Totals	30	8	170	722	28	7	170	663	31	1	126	803	89	16	466	2188
Mean		.03	5.67	24.1		.03	6.1	23.7		.003	4.1	26.0		.18	5.2	24.6

TABLE XVII

SUMMARY OF THE RESPONSES MADE BY 89 SUBJECTS TO BOTH THE VISUAL AND AURAL PARTS OF PHASE I

	No Trial				Wrong				Right			
	Visual		Aural		Visual		Aural		Visual		Aural	
Grade	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
4th	75	2.5	8	.03	491	16.4	170	5.67	334	11.1	722	24.1
5th	37	1.3	7	.03	472	16.8	170	6.1	331	11.8	663	23.7
6th	32	1.0	1	.003	491	15.8	126	4.1	407	13.1	803	26.0
Combined	144	1.6	16	.02	1454	16.3	466	5.2	1072	12.0	2188	24.6

Note: The total number of possible responses is 2670, obtained by multiplying the number of responses on the three trials (30), by the number of subjects (89).

TABLE XVIII

THE DISTRIBUTION OF THE 138 SUBJECTS TESTED IN PHASE II

	4th Grade				6th Grade				
	Sequence "A"		Sequence "B"		Sequence "A"		Sequence "B"		
School	Average	Gifted	Average	Gifted	Average	Gifted	Average	Gifted	Total
A	7	6	8	4	14	9	9	6	63
B	4	4	5	3	4	5	5	3	33
C	5	6	6	4	4	8	4	5	42
Totals	16	16	19	11	22	22	18	14	138

TABLE XIX

SUMMARY OF THE AGES AND I.Q.'s OF THE 138 SUBJECTS IN PHASE II

	Age				I.Q.			
	4		6		4		6	
School	Average	Gifted	Average	Gifted	Average	Gifted	Average	Gifted
A	118.9	119.1	141.5	141.7	107.9	111.5	110.1	114.1
B	116.4	116.6	144.9	140.6	114.2	118.0	111.2	120.1
C	117.4	114.9	142.0	142.0	120.3	127.6	116.3	123.1
CS*	117.8	116.9	142.5	141.6	113.2	119.2	111.8	118.5
CAG**	117.4		142.0		115.8		115.2	

* "CS" = Combined Schools
**"CAG" = Combined Average and Gifted

panied by a similar superiority of intelligence. There is little information available regarding the possible effect I. Q., might have upon musical achievement although it may be assumed that these two are more closely related than I. Q., and musical capacity. The extent of this latter relationship needs to be determined by careful research.

There is reason to believe that experience in playing a musical instrument results in a higher level of music reading ability because instrumental performance tends to crystallize the concepts of pitch and tonal relationships as expressed by musical notation. This information was secured for each subject participating in Phase II and is summarized in Table XXa. The data includes only those subjects reporting instrumental training of 12 months or more. The writer assumed that a shorter period of instruction would probably have little effect upon the ability to read music. The table clearly shows that more "gifted" subjects had such training than "average" subjects. The total N of 16 fourth-grade subjects accounts for 25.8 percent of the total fourth-grade sample; the 37 sixth-grade subjects are 48.7 percent of the sixth-grade sample. When the total group of 138 is considered, the data shows that 53 subjects or 38.4 percent had at least 12 months of instruction. The differences between the three schools, in terms of the sample, may be more clearly shown when the data is expressed as "percent of the total sample," as in Table XXb.

1. Test Results: Tonal Configurations—The results of the testing in Phase II will be presented in terms of each task, rather than in terms of each sequence of tasks, in order to simplify the presentation. The two tasks were: 1) to learn five tonal configurations within a 15-minute testing period; and 2) to learn a short song constructed from these five tonal configurations within a similar 15-minute testing period. For Sequence A, the tonal configurations were first, followed in two days by the song; for Sequence B, the tasks were reversed.

Two kinds of scores will be used to present the results; the "percent correct" scores, and the "rate-of-learning" score. These have been described earlier in the report and it will be remembered that "percent correct" score for each item was calculated by summing the number of correct responses to the item and dividing by the total number of trials for the item; summing the "percent correct" scores for each item and dividing by the number of items gave the "mean percent correct" score for the total task.

One of the first steps taken was to ascertain the reliability of the tests used in Phase II. The subjects in each of the two sequences at each grade level were divided into two equal groups, assignment to groups being made at random. The "average" and "gifted" pupils were combined, as were the three schools. If the differences between the means for each of these two groups was not significant it could be assumed that the tests were reliable, and that any other differences were due to factors other than the tests. Table XXI presents the data for both the learning of tonal configurations and the learning of the song. The "t" values for the split groups in each grade and for each sequence show that no real difference exists between the means and the tests may be considered reliable for this particular sample. It should be pointed out that the scores on the song represent the percentage of correct responses to the tonal configurations within the song.

Analysis of the "mean percent correct" scores for tonal configurations that were presented as a separate task is summarized in Table XXII. The highest possible score is 100, indicating that all five items were correct on every trial taken by the subject. The reader is reminded that for Sequence A this was the initial task, but for Sequence B it was the second task and was performed after the subject had had practice in learning the song. The higher means for average and gifted subjects in each grade who were tested in Sequence B are probably due to this practice which they received. Examination of the individual tabulations shows that a total of 12 fourth-grade pupils and 20 sixth-grade pupils had scores of 100. This represents 23.2 percent of the total sample of 138. More gifted subjects, 10 fourth grade and 18 sixth grade, had perfect scores and it is of interest to note that at the sixth-grade level, 13 of the 20 perfect scores were in Sequence A. The fourth grade showed 9 perfect scores for Sequence B, and only one in Sequence A. It would seem that the practice effect for Sequence B is more evident at the fourth-grade level than the sixth-grade level. It is also possible that the gifted sixth-grade subjects in Sequence A were more competent than their peers in Sequence B.

The data in Table XXII shows the relative superiority of the gifted subjects as compared with average subjects. For each sequence in each grade, the gifted group has a considerably higher mean, a performance which could have been predicted without making the study. Of more interest and of greater significance is the comparison of each group in Sequence A with its parallel group in Sequence B to ascertain the degree to which practice on a related task influences test scores. The "t" tests are shown at the top of

These data appear to support the following conclusions:

1. Practice is more necessary for average fourth-grade pupils than any other group. This group needs to develop an understanding of the concepts involved in reading musical notation.

TABLE XXa

MEAN NUMBER OF MONTHS OF INSTRUMENTAL INSTRUCTION FOR 53 SUBJECTS IN PHASE II

	4th Grade				6th Grade			
	Average		Gifted		Average		Gifted	
School	N	Mean	N	Mean	N	Mean	N	Mean
A	0	0	6	23	4	15	11	32
B	2	24	4	21	3	19	5	39.6
C	1	24	3	44	4	31.5	10	38.4
Totals	3	24	13	27.2	11	22.2	26	35.9
Grand Total	N = 16		Mean = 26.6		N = 37		Mean = 31.8	

TABLE XXb

PERCENT OF SAMPLE REPORTING INSTRUMENTAL INSTRUCTION

	4th Grade			6th Grade			4th and 6th Grades		
School	N	n	%	N	n	%	N	n	%
A	25	6	24.0	38	15	38.5	63	21	33.3
B	16	6	37.5	17	8	47.1	33	14	42.4
C	21	4	19.1	21	14	66.7	42	18	42.9

N = Total number of subjects for each school in each grade.
n = Number of subjects reporting instrumental instruction.
% = n/N

TABLE XXI

"MEAN PERCENT CORRECT" SCORES FOR TWO EQUAL GROUPS

(A) Tonal Configurations

	4th Grade				6th Grade			
	Sequence A		Sequence B		Sequence A		Sequence B	
	I	II	I	II	I	II	I	II
N	16	16	15	15	22	22	16	16
ΣX	1004	935	1109	1147	1703	1489	1254	1140
M	62.75	58.44	73.93	76.47	77.27	67.68	78.38	71.25
ΣX^2	78190	65945	90505	96113	145175	113671	111270	91666
	"t" = .4103		"t" = .2829		"t" = 1.2719		"t" = .7217	

(B) Song

	4th Grade				6th Grade			
	Sequence A		Sequence B		Sequence A		Sequence B	
	I	II	I	II	I	II	I	II
N	16	16	15	15	22	22	16	16
ΣX	985	988	547	675	1831	1647	831	855
M	61.56	61.75	36.47	45.0	83.28	74.86	51.94	53.44
ΣX^2	71867	70734	28479	40191	156341	132793	53249	54849
	"t" = .0203		"t" = .9123		"t" = 1.5509		"t" = .1674	

TABLE XXII

"MEAN PERCENT CORRECT" SCORES FOR AVERAGE AND GIFTED SUBJECTS ON THE TONAL CONFIGURATIONS

	4th Grade				6th Grade			
	Sequence A		Sequence B		Sequence A		Sequence B	
	Average	Gifted	Average	Gifted	Average	Gifted	Average	Gifted
N	16	16	19	11	22	22	18	14
ΣX	602	1337	1224	1032	1227	1985	1203	1275
M	37.63	83.56	64.42	93.82	55.77	90.23	66.83	91.07
ΣX^2	29978	114157	88624	97994	74955	183891	90927	117031

TABLE XXIII

"RATE OF LEARNING" SCORES FOR AVERAGE AND GIFTED SUBJECTS ON THE TONAL CONFIGURATIONS

	4th Grade				6th Grade			
	Sequence A		Sequence B		Sequence A		Sequence B	
	Average	Gifted	Average	Gifted	Average	Gifted	Average	Gifted
N	16	16	18	9	22	17	18	11
ΣX	97.2	533.4	262.5	601.1	299.5	1016.4	309.4	528.2
M	6.08	33.34	14.58	66.79	13.61	59.79	17.19	48.02
ΣX^2	929.44	35215.4	12505.9	53773.8	12985	82015.8	14265.7	36710.6

1.	4th grade,	average,	Sequence A	5.	6th grade,	average,	Sequence A
2.	4th grade,	average,	Sequence B	6.	6th grade,	average,	Sequence B
3.	4th grade,	gifted,	Sequence A	7.	6th grade,	gifted,	Sequence A
4.	4th grade,	gifted,	Sequence B	8.	6th grade,	gifted,	Sequence B

t12 = 3.4689, there is a significant difference between the means at the .01 percent level.
t34 = 1.9550, there is no significant difference between the means.
t56 = 1.6422, there is no significant difference between the means.
t78 = .1897, there is no significant difference between the means.

2. Gifted pupils in both grades already appear to understand these concepts and derive comparatively little benefit from practice since their scores are already relatively high.
3. Average sixth-grade pupils do not show significant improvement as a result of practice, but this may be due to a number of factors such as a general lack of interest in reading music; not fully understanding the concepts involved in music reading; and lack of experience in reading independently. This study does not attempt to identify the factors which may be present.

The writer was particularly interested in attempting to identify the rate at which pupils in these two groups were able to learn the five test items. For this purpose a "rate-of-learning" score, described earlier, was used as a means of identification. This score is based on the gains made by the subject, these gains being divided by the number of trials taken by the subject as an indication of the rate at which the gains were made. The initial trial was not included in the total number of trials. This score did have several disadvantages, but the writer was not able to find a scoring system which could be adapted to the present study. The disadvantages are as follows:

1. The subject earning a perfect score on the initial trial cannot improve his score and consequently receives an RL score of 0. In treating the data, the writer arbitrarily excluded those subjects for whom no rate of learning would be possible.
2. The subject who either made no gains from the initial trial to the final trial or who earned a lower score on the final trial than on the initial trial, received an RL score of 0. These subjects are included in the data because the opportunity for learning was always present. The reason for assigning a 0 to the subject whose score became poorer was a device to avoid the problems inherent in working with negative values.
3. The RL score is based on the total test and is not, as is the case with the mean "percent correct" score, an average of the performance on each item. This works to the disadvantage of the subject who requires many trials to learn a single item, the other items being correct within the first few trials. In view of the totality of the task which involved learning the song, the writer decided to score the tonal configurations as a group rather than individually. One reason for the difficulty encountered in scoring the tasks in this study is due to the complex nature of the tasks themselves. Research activity in the field of music although calling attention to the existence of a scoring problem, fails to recommend more adequate methods of scoring.

The highest RL score a subject could earn is 100, possible only if the subject needed only a second trial on the test to learn the items not responded to correctly on the initial trial. There were 9 fourth-grade subjects and 12 sixth-grade subjects with RL scores of 100. An additional 3 fourth-grade subjects and 8 sixth-grade subjects did not have an RL score because they made correct responses to all the items on the first trial of the test. Table XXIII summarized the RL scores for the sample. The difference between the two groups in each grade is quite evident, with the mean for gifted subjects being four to five times as large as that for average subjects. The table also shows that the means for subjects in Sequence B were higher than the means for the parallel group in Sequence A, with the exception of the gifted pupils in sixth grade.

To ascertain the degree to which practice on a related task influenced the RL scores of subjects in Sequence B, "t" tests for the significance of the differences in the means were made. The "t" tests are shown at the top of the next page.

These data parallel the results of the "t" tests made to test the significance of the differences between the means of the "percent correct" scores, a result which was predictable because of the similarity of the two kinds of scores.

The reader will recall that for Phase I the differences in mean scores for fourth and sixth grades had given a t of 1.8397 and it was concluded that the differences were not significant. The 138 subjects in the present sample were considered only in terms of grade; no differentiation being made between average and gifted or between the two sequences. The t test gave a t of .9169

1.	4th grade,	average,	Sequence A	5.	6th grade,	average,	Sequence A
2.	4th grade,	average,	Sequence B	6.	6th grade,	average,	Sequence B
3.	4th grade,	gifted,	Sequence A	7.	6th grade,	gifted,	Sequence A
4.	4th grade,	gifted,	Sequence B	8.	6th grade,	gifted,	Sequence B

t12 = 1.8036, there is no significant difference between the means.
t34 = 2.1846, there is a significant difference between the means at the .05 percent level.
t56 = .5356, there is no significant difference between the means.
t78 = .8592, there is no significant difference between the means.

These data parallel the results of the "t" tests made to test the significance of the differences between the means of the "percent correct" scores, a result which was predictable because of the similarity of the two kinds of scores.

The reader will recall that for Phase I the differences in mean scores for fourth and sixth grades had given a t of 1.8397, and it was concluded that the differences were not significant. The 138 subjects in the present sample were considered only in terms of grade; no differentiation being made between average and gifted or between the two sequences. The t test gave a t of .9169 and it was again concluded that the difference between the two grades, in terms of mean RL scores, was not significant. The mean for the fourth grade was 26.17; for the sixth grade, 31.67.

It will be remembered that in Phase I the scores for the three schools showed a significant difference existing between School B and the other two schools, but that the difference between Schools A and C was not significant. The sample for Phase I was a random sample while the subjects for Phase II represented two distinct levels of competence, with only the average group selected on a random basis. To ascertain whether School B continued to rank the lowest in terms of achievement, the RL scores on the tonal configurations for the three schools, combining grades and groups, were analyzed. Analysis of variance showed that there was a significant difference between the three schools at the 5% level, F = 4.5328. This data is presented in Table XXIV. The "t" tests for the significance of the differences between schools showed the following:

1. Between Schools A and B, t = 1.3265, and the difference is not significant.
2. Between Schools A and C, t = 2.9211, and the difference is significant at the one percent level.
3. Between Schools B and C, t = 1.764, and the difference is not significant.

The means of these three schools were: School A, 21.47; School B, 26.99; and School C, 42.09. The data tends to support the following conclusions:

1. Subjects in School C performed at a high level of competence in both Phases I and II.
2. Subjects in School A performed similarily to those in School C for Phase I but on Phase II their performance more closely paralleled that of School B.
3. Subjects in School B ranked lowest in performance on Phase I but paralleled School A on Phase II.
4. The change in position of School A for the two phases may be due to the differences in samples. It is also possible that Phase II represents a more accurate evaluation of the pupils in the schools than did Phase I. If this is the case, then it may be concluded that subjects in Schools A and B are similar while the subjects in School C are different, in terms of general competence in reading music.

2. Test Results: Song—For Sequence A, the song followed a 15-minute learning period of the five tonal configurations, for Sequence B it was the initial task. Analysis of the "percent correct" scores, with 100 the highest possible score, showed a total of only 10 perfect scores. It will be remembered that in scoring the song, the score unit was the tonal configuration within the song. Two gifted fourth-grade subjects, one in each sequence, and 8 gifted sixth-grade subjects in Sequence A account for the perfect scores. This is a partial indication that learning a song is a more difficult task than learning individual tonal configurations, for which 32 perfect scores were obtained. The data in Table XXV, again, indicate the superiority of the gifted subjects. Comparisons between the groups for the two sequences show the following:

1. For the 4th grade, average, Sequence A with Sequence B, t = 3.0018, indicating that the difference between the means is significant at the one percent level.
2. For the 4th grade, gifted, Sequence A with B, t = 2.0170, indicating no significant difference between the means.
3. For the 6th grade, average, Sequence A with B, t = 5.2728, indicating a significant differ-

TABLE XXIV

ANALYSIS OF VARIANCE BETWEEN SCHOOLS FOR THE TONAL CONFIGURATIONS OF PHASE II

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square
Total	144347.7997	127	
Schools	9760.9410	2	4880.4705
Pupils in Schools	134586.8587	125	1076.6949
			(F = 4.5328)

TABLE XXV

"MEAN PERCENT CORRECT" SCORES FOR AVERAGE AND GIFTED SUBJECTS ON THE SONG

	4th Grade				6th Grade			
	Sequence A		Sequence B		Sequence A		Sequence B	
	Average	Gifted	Average	Gifted	Average	Gifted	Average	Gifted
N	16	16	19	11	22	22	18	14
ΣX	690	1283	484	738	1466	2012	667	1019
M	43.13	80.19	25.47	67.09	66.64	91.45	37.06	72.79
ΣX^2	36572	106029	15432	53238	103322	185812	30909	77189

ence at the .001 level.
4. For the 6th grade, gifted, Sequence A with B, t = 4.5811, indicating a significant difference between the means at the .001 level.

These results support the following conclusions regarding the importance of practice in learning to read a song:

1. Only the gifted fourth-grade subjects did not appear to be influenced by the presence or absence of practice on tonal configurations prior to learning a song; this is, of course, true only for this particular sample.
2. For all other groups, especially at the sixth-grade level, prior practice on tonal configurations resulted in significant improvement in reading the song. This was not evident when the scores on tonal configurations were compared on the basis of prior practice on the song. This tends to indicate that the reading of songs should be preceded by some prior related activity, not necessarily learning tonal configurations, so the subject moves from the simple to the complex and is aware of what is taking place.

No attempt was made to compare the scores for the song with those of the tonal configurations, because, in view of the different nature of the two tasks, such comparisons could not be completely justified.

The "rate of learning" scores for the song were analyzed in the same manner as those for the tonal configurations. Only two gifted sixth-grade subjects who were in Sequence A had a perfect score on the initial trial of the song. Eight additional gifted subjects had an RL score of 100, as compared with the 21 subjects having RL scores 100 on the tonal configurations. Table XXVI gives the data for the eight groups, and it is again evident that gifted subjects perform at a much higher level. With the exception of the fourth-grade gifted subjects, all groups in Sequence A showed higher RL scores than those in Sequence B. When one compares Table XXVI with Table XXIII it may be seen that the RL scores on the song are considerably lower than the RL scores on the tonal configurations. The t tests between the various groups comparing the two sequences showed the following:

1. For 4th grade, average, Sequence A with B, t = 1.0677, indicating no significant difference at the 5 percent level.
2. For 4th grade, gifted, Sequence A with B, t = .1847, indicating no significant difference.
3. For 6th grade, average, Sequence A with B, t = 3.6322, indicating a significant difference at the .001 percent level.
4. For 6th grade, gifted, Sequence A with B, t = 2.6444, indicating that the differences between mean RL scores is significant at the .02 percent level.

The results agree, in general, with the t tests made for the "percent correct" scores on the song and would indicate that the more musically mature and experienced sixth-grade subject is better able to profit from certain types of related practice than the fourth-grade subject.

The four groups in each grade were combined into a single group and the RL scores for the two grades compared. The data showed a mean of 13.15 for fourth grade; 21.19 for sixth grade. The t test gave a t of 2.0532 and the difference between the means of the two grades was considered to be significant at the 5 percent level. This would also support the conclusion that the maturity of the sixth-grade subject gives him an advantage when the rate of learning is considered.

It has been established that for Phase I and for the tonal configurations of Phase II, the differences between the three schools was significant. The means of the RL scores on the song, combining all groups within each school, were as follows: School A, 15.09; School B, 17.48; and School C, 19.10. Analysis of variance showed that these differences were not significant at the 5 percent level, F = .4182.

It may be concluded that the samples from the three schools vary considerably when comparisons are made in terms of achievement scores, such scores reflecting previous musical training and experience; but that these same samples do not vary significantly when comparisons are made in terms of the ability of the subjects to learn the song. The tasks which served as a basis for comparing schools in Phase I and the tonal configurations of Phase II evidently gave the subjects a greater opportunity to utilize previous experiences than did the learning of the song. This also supports the generally accepted point of view that reading a song is a highly complex process.

3. Test Results: Identity of Tonal Configurations—One of the major purposes of this exploratory study was to test the hypothesis that tonal configurations which are readily perceived in isolation tend to retain their identity when presented in the usual context of a song. The data used for this aspect of the study is the "percent correct" score for each tonal configuration in the five-item test and the same score for each item in the song. The product-moment correlations for all groups on each item were calculated and the basis for comparison is the size of the resultant "r." The raw data will not be used in this section of the report in order to simplify and condense the presentation. For the same reason, no attempt is made to retain the identity of the individual schools.

Preliminary correlations for the complete test were calculated, with the "percent correct" score for the five-item test compared to the "percent correct" scores for the tonal configurations with-

TABLE XXVI

"RATE OF LEARNING" SCORES FOR AVERAGE AND GIFTED SUBJECTS ON THE SONG

	4th Grade				6th Grade			
	Sequence A		Sequence B		Sequence A		Sequence B	
	Average	Gifted	Average	Gifted	Average	Gifted	Average	Gifted
N	16	16	19	11	22	20	18	14
ΣX	91.7	314.4	81.3	236.1	277.4	966.0	99.3	302.6
M	5.73	19.65	4.28	21.46	12.61	48.3	5.52	21.61
ΣX^2	836.99	14006	565.5	12892.8	4520.9	70862.7	957.55	9192.1

TABLE XXVII

ANALYSIS OF VARIANCE BETWEEN SCHOOLS FOR THE SONG OF PHASE II

Source of Variation	Sum of Squares	Degrees of Freedom	Mean Square
Total	65770.5199	135	
Schools	411.0686	2	205.5343
Pupils in Schools	65359.4513	133	491.4244
			(F = .4182)

in the song. This procedure gave the following correlations for the combined schools:

1.	4th,	average,	Sequence A	r = .32
2.	4th,	average,	Sequence B	r = .71
3.	4th,	gifted,	Sequence A	r = .42
4.	4th,	gifted,	Sequence B	r = .44
5.	6th,	average,	Sequence A	r = .58
6.	6th,	average,	Sequence B	r = .37
7.	6th,	gifted,	Sequence A	r = .41
8.	6th,	gifted,	Sequence B	r = .60
9.	4th,	average and gifted,	Sequence A	r = .72
10.	4th,	average and gifted,	Sequence B	r = .74
11.	6th,	average and gifted,	Sequence A	r = .76
12.	6th,	average and gifted,	Sequence B	r = .61

It will be noted that the correlations for the fourth-grade average and the sixth-grade gifted are considerably higher for groups in Sequence B than for those same groups in Sequence A. The reverse is true for the sixth-grade average groups, and there is little difference between the two sequences when the fourth-grade gifted groups are considered. When the two ability groups are combined, the differences between sequence for the fourth grade become less evident and the sixth grade shows a higher correlation for Sequence A. It is interesting to note that these correlations are higher than those obtained for the individual ability groups. For Sequence A, fourth-grade average was .32 and fourth-grade gifted was .42, but when the two groups are combined the "r" becomes a .72. It is the opinion of the writer that these higher correlations result from the fact that the average subjects are at the lower end of the distribution and the gifted subjects at the upper end, thus yielding a higher correlation than when each group is treated separately.

These preliminary correlations show that there is a tendency for tonal configurations to retain their identity. In order to present more complete data, the same kinds of correlations were calculated for each of the five tonal configurations used in Phase II. These will be discussed individually and then summarized at the conclusion of the section. In preference to a summary table, the means for each item, together with the correlations, will be presented at the time each item is considered. Mx will designate the mean of the item when presented in the five-item test, and My will refer to the mean of the same item as it appeared in the song (see top of next column).

This item was the first measure of the song and one would anticipate, because of its unique character, that subjects would experience little difficulty in recognition. The means of the various groups show that sixth-grade subjects are

Item 1: ($S\overline{D}\overline{M}$)

Sequence A

	Average		Gifted	
	Mx	My	Mx	My
4th	23	66	71	89
	r = .10		r = .08	
6th	49	87	78	99
	r = .45		r = -.16	

Sequence B

	Average		Gifted	
	Mx	My	Mx	My
4th	74	64	94	87
	r = -.56		r = .44	
6th	72	61	88	89
	r = .37		r = -.04	

more familiar with the item than are fourth-grade subjects, the exception being the average sixth-grade group in Sequence B. There is considerable variation for the correlations and only three of these appear to show that subjects recognized the item when it appeared in a context different from its initial presentation. For Sequence A the average sixth-grade group seemed to be most aware of the item; for Sequence B the average sixth-grade and gifted fourth-grade groups are consistent. The high negative correlation for the average fourth-grade group, Sequence B, indicates considerable shifting of position from task to task. This shifting is not unusual but it does present problems of interpretation. The remaining four correlations are so low as to imply that little identification took place.

Item 2 is the simplest item of the five and occurred twice within the song.(next page). Treatment I is the comparison of the individual item (Mx) with the first appearance of the same item in the song (My). Treatment II compares the individual item with the second appearance of the item in the song (Mz), and Treatment III shows the relationship of the two items (My and Mz) as they appear within the song.

All groups showed relatively high means on the item, the lowest means are on the second appearance of the item in the song for the average sixth-grade group in Sequence B. In general, the individual item shows higher means than the item within the song. For Treatment I, the only group to show consistent recognition is the gifted fourth grade, Sequence A. The data showed that the first appearance of the item in the song tended to conceal its true identity. The means for the second

Item 2: (M R D)

Treatment I

	Sequence A				Sequence B			
	Average		Gifted		Average		Gifted	
	Mx	My	Mx	My	Mx	My	Mx	My
4th	62	64	91	98	76	44	83	76
	r = .10		r = .93		r = .02		r = .28	
6th	69	85	96	98	75	53	92	92
	r = .20		r = .29		r = -.03		r = -.14	

Treatment II

	Mx	Mz	Mx	Mz	Mx	Mz	Mx	Mz
4th	62	33	91	76	76	15	83	67
	r = -.17		r = .38		r = .41		r = .53	
6th	69	58	96	90	75	19	92	67
	r = .32		r = .08		r = .34		r = .02	

Treatment III

	My	Mz	My	Mz	My	Mz	My	Mz
4th	64	33	98	76	44	15	82	67
	r = .79		r = .52		r = .48		r = .93	
6th	85	58	98	90	53	19	92	67
	r = .22		r = .28		r = .30		r = .26	

appearance in the song, Treatment II, are uniformly lower for each group than the means for the first appearance. There is a slightly higher amount of recognition for the second appearance of the item as evidenced by the five "r's" above .30. Treatment III shows that two appearances of the same item within a song tend to increase the degree of recognition which takes place.

All "r's" are positive, and five are .30 or higher. No single group shows a consistent performance on the item, the higher "r's" shifting from group to group for each treatment. The lack of stability suggests that subjects are not aware that the item exists as a note-grouping, but are reading it as unrelated individual notes. The two appearances within the song emphasize the grouping because the item has the same rhythmic structure in both instances and is a complete measure, the measure bars setting it apart as an entity.

The data also show that the "r's" in Treatments I and III are higher for Sequence A than for Sequence B; while in Treatment II, Sequence B is the preferred sequence. This suggests that for this item those subjects having prior practice on the individual items carried over more recognition than the subjects who began with the song and related this experience to the individual items. The data also show that for Sequence B the fourth grade is more apt to recognize the item in a different context than is the sixth grade. The additional experience may cause the sixth-grade subject to read less carefully and "invent" a response which seems more appropriate, in terms of the total situation, than the item actually presented to him.

Item 3: (S M $\overline{F}$ R)

Sequence A

	Average		Gifted	
	Mx	My	Mx	My
4th	28	37	75	78
	r = .44		r = .40	
6th	45	61	93	95
	r = .20		r = -.16	

Sequence B

	Average		Gifted	
	Mx	My	Mx	My
4th	40	8	80	42
	r = .70		r = .64	
6th	58	23	92	64
	r = .39		r = .73	

Although only the gifted fourth grade in Sequence A shows high mean scores on the item, all but one of the "r's" is positive, with six being .39 or higher. The disjunct, but sequential characteristic of this item appears to simplify the recognition process since subjects remember the uniqueness of the item even though they may not always be able to sing it correctly. The fourth-grade subjects show a much higher degree of recognition and greater consistency than do the sixth-grade subjects, although the latter earned higher means throughout.

For this item the subjects in Sequence B show a higher degree of recognition than subjects in Sequence A which suggests that the appearance within a song is more meaningful than an isolated presentation.

Item 4: (F M R D)

Sequence A

	Average		Gifted	
	Mx	My	Mx	My
4th	51	22	91	54
	r = .25		r = .18	
6th	64	44	90	75
	r = .17		r = .65	

Sequence B

	Average		Gifted	
	Mx	My	Mx	My
4th	78	10	97	47
	r = .35		r = .14	
6th	56	24	93	52
	r = .15		r = .30	

Item 4 proved to be more difficult in the song than as an individual item and this is shown by the lower My values. The chief reason for this was because it began the interval of a fourth above the final tone of the previous measure, and subjects experienced difficulty in locating the correct tone. Although only three of the correlations are .30 or higher, all "r's" are positive, indicating recognition of the item by many subjects. The size of the "r's" for the various groups does not show a consistent pattern, nor does one sequence seem to be preferred to the other although the gifted subjects in Sequence A do better than their peers in Sequence B.

The means of the gifted subjects in both sequences continues to exceed the means of the average subjects, a behavior that has been consistent throughout the testing (Item 5). The identity of the item appears to be retained since all "r's" are positive. For Sequence A the fourth-grade subjects, with higher "r's" than sixth-grade subjects, apparently are more aware of the individual character of the item even though their mean scores are lower. In Sequence B, the sixth grade has the higher "r's". The data show that subjects within most groups shift their position from task to task, a shifting that has been evident in the analysis of each item.

Item 5: (S L S F M)

Sequence A

	Average		Gifted	
	Mx	My	Mx	My
4th	19	31	84	86
	r = .50		r = .34	
6th	51	64	95	97
	r = .39		r = .13	

Sequence B

	Average		Gifted	
	Mx	My	Mx	My
4th	54	14	100	70
	r = .44		r = 0	
6th	73	42	91	81
	r = .49		r = .72	

4. Summary of The Findings—1. The average fourth-grade and gifted sixth-grade subjects in Sequence B show a higher degree of recognition of tonal configurations than do these same groups in Sequence A when the correlations between items on the song and individual items is considered. This suggests that these subjects identify tonal configurations presented individually more readily if they have had previous opportunity to observe those configurations in a song. It also implies that for these same groups, practice on tonal configurations does not lead to greater recognition of these same configurations in the song. The reverse holds for the average sixth-grade subjects in the sample.

2. The subjects within all groups do not perform consistently, as evidenced by the variation in the size of the "r's" for each item. The factors which cause this shift cannot be identified at the present time, but it is reasonable to assume, in view of the reliability of the test, that the effort and attitude of the subject are significant factors.

3. The data from the present study does not offer strong support for the point of view that tonal configurations tend to retain their identity in different contexts unless one is willing to accept

the coefficient of correlation obtained for the combined gifted and average subjects in each sequence as sufficient evidence of such retention. These were all relatively high, .61 to .76, and may represent a more dependable value than the "r's" obtained for each of the sub-groups.

4. The item, if it is to retain its identity from one situation to another, must first be learned. The testing carried on in Phase II did not result in such learning for the majority of the subjects. Shorter, more numerous practice sessions would eventually result in learning the items and a second task presented at that time might have significantly raised the "r's" for the groups.

5. The variability of the "r's" makes it impossible to identify any one sequence of tasks as the most desirable for the development of item recognition. The addition of a third task might well have provided the kinds of data needed to make such a judgment.

6. For all items, the gifted subjects in each grade for each sequence had higher scores than did the average subjects. In 20 of the 28 comparisons of scores the sixth-grade gifted subjects scored higher than the fourth-grade gifted. This is not the same when the "size" of the "r's" are compared. For these same groups the data show that in Sequence A the fourth-grade gifted group had higher "r's" than the sixth-grade gifted group in five out of seven such comparisons; for Sequence B the fourth-grade gifted group was higher than the sixth-grade gifted group in four out of seven comparisons.

7. The same results appear when the average groups in each grade are compared. The sixth-grade scores are higher in each case than fourth-grade scores, while the "r's" for fourth-grade groups are higher in nine of the fourteen comparisons than the "r's" of the sixth-grade groups.

8. When each item is considered individually no single item shows a uniformly high degree of recognition by all the various groups. Item 3 and the two appearances of Item 2 within the song appear to retain this identity better than any other item. The data show that for these items the fourth-grade "r's" are higher than sixth grade in 13 out of 16 comparisons. For Items 1, 4 and 5 the sixth-grade "r's" are higher than those of the fourth grade in 8 of 12 comparisons. This is a more reliable indication of what is taking place and shows that fourth-grade subjects tend to retain items that are either very simple or which have distinctive characteristics. When the item is neither of these, the sixth-grade subjects are better able to detect the subtle differences and identify the item in a new context.

9. It may be concluded that the sixth-grade subjects in Phase II of the study not only demonstrated a higher level of achievement but also showed a greater degree of item recognition for the test as a whole.

5. The Influence of Instrumental Instruction on Test Scores—It has been mentioned earlier that many music educators feel that experience in playing a musical instrument results in a higher level of music reading ability, because instrumental performance tends to clarify the abstractions of musical notation. A total of 53 subjects in Phase II had reported instrumental training of at least 12 months or more. The "mean percent correct" scores on the tonal configurations were used as the basis of comparing the pupils within groups who had training with those having no such training. The results are summarized as shown at top of next page.

The "t" tests made show that differences between the means were not considered significant at the 5 percent level and it may be concluded that the instrumental training had little effect upon the test scores of the subjects in the sample.

There are several factors which need to be considered before any conclusions can be reached:

1. The groups compared are all relatively small.
2. Piano was the instruemtn mentioned most frequently, and this may not influence music reading ability, in the sense of this study, as much as a single-line instrument like the violin.
3. The nature of the instruction may have given more emphasis to technical performance than to developing skill in reading music.
4. The instrument may not have been studied long enough to enable the child to develop an adequate concept of the process of music reading.
5. The tests may not really give a true measure of music reading ability, especially since the use of a vocal response may have served as a deterent.

For these reasons the writer is not willing to go beyond the limitations of the present study.

6. Relationship Between Scores on Tonal Configurations and the Teacher Ratings and Kwalwasser Tests—The writer has already discussed the problem associated with the identification of the musically gifted children. There are many possible definitions of gifted children and this study defined the musically gifted subject as the child whose musical achievement was superior to that demonstrated by the majority of his classmates. This superior achievement results from favorable attitudes toward musical activities, general knowledge about music, and performing skill in singing and playing instruments. The experienced teacher, having contact with the children over an extended period of time, should be able to evaluate those outstanding children in each group. The Kwalwasser Music Test does not measure achievement but seeks to identify native capacity.

Group	Without Training N	Mean	With Training N	Mean	"t"
4th Average, Sequence A	15	39.3	1	13	
4th Average, Sequence B	16	66.8	3	85.3	1.3536
4th Gifted, Sequence A	4	79.3	12	85.0	.7763
4th Gifted, Sequence B	6	90.3	5	98.0	1.1936
6th Average, Sequence A	17	54	5	57.6	.3339
6th Average, Sequence B	12	66	6	68.5	.1952
6th Gifted, Sequence A	6	84.0	16	92.5	1.1961
6th Gifted, Sequence B	5	91.8	9	90.7	.2330

Data presented earlier in the report showed the correlations between the teacher's ratings and the Kwalwasser Test to be relatively low for all schools. This is to be expected because the two criteria do not measure exactly the same things. To ascertain which criterion measure, if any, had the closest relationship to the reading of tonal configurations in Phase II, the product-moment correlations were computed for the average and gifted subjects in each school. These correlations are represented as AB and AC:

1. A represents the scores on tonal configurations.
2. B represents the scores on teacher ratings.
3. C represents the scores on the Kwalwasser test.

These "r's" are given for each grade in each school as follows:

School	Grade	Av. or Gifted	rAB	rAC
1. A	4	A	.60	-.06
2. A	4	G	.21	-.10
3. A	6	A	.08	-.14
4. A	6	G	.48	-.36
5. B	4	A	.79	.17
6. B	4	G	-.03	.59
7. B	6	A	-.28	-.07
8. B	6	G	-.29	.17
9. C	4	A	-.25	.42
10. C	4	G	.03	.17
11. C	6	A	.13	-.69
12. C	6	G	-.10	-.09

These data show a lack of consistency, not only from school to school but for the various groups as well. The data show the following:

1. Neither of the criterion measures are able to show a consistent relationship with the task used in Phase II, although the teacher's rating correlates higher than the Kwalwasser for all groups in School A.
2. For School B the preference is given to the Kwalwasser test although the correlations are so low as to indicate that such a basis is not reliable. School C is similar to School B.
3. When the gifted subjects are considered, the higher "r's" occur for the Kwalwasser in four out of six such comparisons.
4. When the average subjects are considered, the higher "r's" occur for the teacher's ratings.

On the basis of the data obtained, the writer finds himself in agreement with the many other investigators who have attempted to establish some basis for identifying musically gifted individuals, that this basis is yet to be discovered. It is possible that the most adequate basis for making such identification is the performance on the tasks in Phase II rather than outside criteria. It is also quite possible that the absence of a large number of significantly high "r's" and the lack of a consistent pattern shows that teachers are not in a position to adequately evaluate the music reading ability of their pupils because there is comparatively little opportunity for individual attention within the classroom situation.

V. Summary and Conclusions

Summary of Major Findings Based on the Analysis of Data

1. There is no significant difference between boys and girls in terms of the ability to read music.

2. For Phase I there were no significant differences between the scores earned by fourth-, fifth-, and sixth-grade subjects. For Phase II there were no significant differences between fourth and sixth grades either in terms of general scores or in terms of the rate of learning scores for tonal configurations. However, the RL scores on the song showed a significant difference between these two grades.

3. When "percent correct" scores were used, there were significant differences between the three schools; School C, while comparable to School A in Phase I, was higher than the other

two schools in Phase II. School B ranked lower on Phase I and was comparable to School A on Phase II. There were no differences when RL scores on the song were used as a basis for comparison.

4. The analysis of data for Phase I showed:
   a. The subjects experienced considerable difficulty in reading tonal configurations which commonly appear in the songs they sing.
   b. The common reading errors revealed a general tendency to respond to the outward shape of the configuration, but to but to substitute a similar, more familiar one being read.
   c. Considerable guessing takes place when subjects attempted to read, as evidenced by the number of different errors which were made.
   d. The subjects performed at a much higher level on the aural part of the test than on the visual part. There were few common errors, the major cause for error arising out of the subjects' apparent inability to retain the sound of the starting pitch throughout the presentation of the item.
   e. The relationship between the responses to the aural and visual presentations of an item was not as high as expected, "r's" of .50 to .70. This is, however, not as accurate a comparison as might have been made.

5. The teacher's ratings of subjects were compared with the results of the Kwalwasser test and showed very low correlations.

6. Gifted subjects in Phase II consistently did better than average subjects on each task. They knew more about reading music, as evidenced by the "percent correct" scores, and learned the material at a rate three to four times faster than average subjects.

7. The song was a more complex task than the individual tonal configurations, regardless of the sequence of tasks.

8. Comparisons between sequences for the various groups, using the scores earned on tonal configurations as a basis for comparison, showed the following:
   a. The "percent correct" scores for groups in Sequence B, with prior practice on the song, were not significantly higher as a result of this practice than the scores for groups in Sequence A who did not have practice. Only the fourth-grade average group seemed to benefit from
   b. The RL scores for groups in Sequence B were not significantly higher than the scores for groups in Sequence A except for the gifted fourth-grade subjects.

9. Comparisons between sequences for the various groups, using the scores earned on the song showed the following:
   a. The "percent correct" scores for groups in Sequence A, with prior practice on tonal configurations, were significantly higher as a result of this practice than the scores for groups in Sequence B who had no practice. Only the gifted fourth-grade group seemed not to benefit from such practice.
   b. The RL scores for sixth-grade groups in Sequence A were significantly higher than the scores for the sixth-grade groups in Sequence B. There were, however, no significant differences between fourth-grade groups in the two sequences.

10. Analysis of the degree to which tonal configurations retain their identity from one situation to another showed that:
   a. Average fourth-grade and gifted sixth-grade subjects show greater recognition when the sequence from song to configuration is followed.
   b. Average sixth-grade subjects show greater recognition when Sequence A is followed.
   c. Considerable shifting of the position of the subjects from one task to another takes place within all groups. This variability makes it difficult to accurately interpret the "r's".
   d. Items 2 and 3 show fairly consistent recognition by fourth-grade groups; Items 1, 4 and 5 are more readily recognized by sixth-grade groups.

11. The scores of subjects in this study who reported instrumental training were not significantly higher than the scores of subjects who did not have such training.

12. The identification of gifted and average subjects on the basis of teacher's ratings and the Kwalwasser test does not result in a high level of reliability in terms of this study.

Implications of the Study

1. The time allowed for the tasks in Phase II was not sufficient to result in complete learning by most of the subjects. This suggests that more learning sessions, rather than longer ones, would result in greater understanding of the concepts of musical notation.

2. Accurate reading of musical notation is more likely to result when greater emphasis is placed upon understanding the significance of the notation rather than upon mere "imitation" of musical materials.

3. The musically superior child needs to be given more opportunities to develop music reading competence. The data show both fourth- and sixth-grade superior children to learn at a much

more rapid rate than average children, a fact that must be considered in planning the music activities for the grades.

4. The data did not clearly establish that one sequence of tasks is superior to the other in developing music reading competence. It did show, however, that although prior practice on the song did not appear to have much effect upon the scores obtained for learning individual configurations, learning the song was made more effective through prior practice on tonal configurations. The fact that the song is usually approached as a complete entity, as it should be, makes it difficult for children to then recognize the individual elements of the song when they are isolated.

5. If the music reading is approached by means of the configuration, greater emphasis needs to be placed upon helping children recognize the shape and design of such configurations. Subjects in this study were unable to identify the configurations in the song which they had previously learned as individual items until they were asked to make such an identification.

6. The results of the study showed that these sixth-grade children did not perform significantly better than the fourth-grade children, although they clearly demonstrated a faster learning rate for the song. This implies that very little actual growth in music reading skill takes place beyond the fourth-grade level, because the children are not given the necessary musical tools with which to work. The tools in this sense of the work are the knowledges and understandings about musical notation which are developed through independence of action.

7. Instrumental instruction did not seem to be a factor in the music reading abilities of either the average or gifted children in this study. The training will exert a greater influence if greater emphasis is given to the meaning of the musical notation rather than to mere mechanical responses to visual stimuli. It is highly probable that instrumental training at this level is more concerned with developing control over the instrument so that he is not able to give his attention to other problems of performance.

8. The procedures followed in this study are adequate, but improvements need to be made in methods of scoring and evaluating the data.

9. The problem of the visual perception of music symbols needs to be extended to ascertaining whether tonal configurations learned in one key are readily perceived when presented in other tonalities where the notation is different.

10. The relationship between auditory and visual perception needs to be more clearly established. Music educators recognize the interdependence of the two, but the degree to which one depends upon the other needs to be identified. Many reading errors made in this study were caused by the subject's inability to "hear internally" what the stimulus should sound like and, consequently, were unable to control the voice.

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A STUDY OF RELATIONSHIPS BETWEEN IMPORTANCE OF A SCHOOL SUPERINTENDENT'S FUNCTIONS AND HIS PRACTICES, BASED ON AUTHORITATIVE OPINION

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ONE OF THE most important and influential public officials in America is the public school superintendent of schools. Within the legal structure of school government extant in each state, the superintendent of schools is an executive officer directly responsible to a local board of control for the maintenance, operation, and administration of the public schools established within the district over which the controlling board has legal jurisdiction.

Early New England public schools were controlled and maintained by decisions reached in town meetings. Later as the population increased and school enrollment grew, appointed and elected representative boards of control came into being whose function it was to maintain and operate the respective local public schools. After nearly 200 years, the increased size of school enrollments had operated as one factor to precipitate increasingly complex and numerous problems related to the administration of public schools. It became difficult for members of a board of control to administer the schools as had previously been possible under frontier conditions. During the 121 years since the first city superintendent of schools was appointed at Buffalo, New York, the functions and duties of the office of superintendent of schools have evolved gradually to their present day status. Functions of the office became more numerous and complex as increasingly better and more highly trained persons were available, demanded, and employed for that position. The position has become more exacting and subject to varied and increased numbers of extra- and quasi-legal, political, economic, religious, and sociological pressures. The effects of these pressures and demands on the time of the superintendent of schools were suggested by Norton[1]* when he stated that "The school superintendency is becoming an untenable position in some large cities, and in many middle-sized and smaller communities it is not a bed of roses." The nature of the public school superintendent's functions, duties, and responsibilities is constantly evolving.

The Evolving School Superintendents' Task and Function—Perusal of the literature relating to the school superintendents' task seems to warrant certain conclusions pertaining to changes in emphasis and nature of concepts held regarding the office. More recently there seems to be increased emphases upon the welfare of the child as the criterion for justifying and evaluating the effectiveness of administration. Increased emphases on the responsibility and role of administration for the improvement of instruction, including attention to the selection of a well qualified staff, have been noted. It seems also, that a major evolving change of emphases in concept relates to the increased trend toward democratic policy making and problem solving simultaneously with need to delegate duties to others. This change involves wider utilization of staff, pupils, and school patrons in the community in formulating policy and solving problems. Increased emphasis is also indicated on the function of public relations.

In 1923 the Department of Superintendence of the National Education Association queried school superintendents on their perception of the importance of various functions deemed to be those of a superintendent of schools, and a similar study was repeated in 1933 by the American Association of School Administrators.[2] Data obtained in each of these two years reveal the changing concept of school superintendents relative to the importance of various functions. During that decade increased emphasis was noted on personnel problems and supervision of instruction, while a decrease in emphasis on importance of functions relating to budget, purchasing problems, census taking, and buildings and grounds was evidenced.

*All footnotes will be found at end of article.

In 1950, 1586 school superintendents responded to an inquiry conducted by the American Association of School Administrators concerning the actual and ideal percentage of time distribution for superintendents among eight major broad classifications of functions.[3] Data revealed that the function of "instructional leadership" was considered as the one to which superintendents do and should devote the most time.

However, school superintendents expressed need for more time emphasis on 1) instructional leadership, 2) general planning, and 3) public relations. They indicated too much time was devoted to 1) financial administration, 2) personnel administration, and 3) school plant management.

The earlier studies cited, regarding the relative importance of school superintendents' functions were based upon what school superintendents responding to a study thought. The first major effort to measure the superintendent's thinking and practice against some sort of criteria was made by Russell.[4] After synthesizing the literature related to functions of a school superintendent, he developed a list of 38 functions. This list was submitted to a jury of carefully selected experts consisting of 100 outstanding school superintendents, 60 outstanding professors of school administration and 20 other distinguished educators. Jury members were distributed throughout the United States and included all the nation's well known leaders in the area of school administration. The jury of 180 persons was asked to indicate the relative importance of the functions included on the listing.

An identical list of functions was submitted to superintendents of all (116) Oklahoma North Central Association schools. Superintendents were also asked to indicate their judgment concerning the relative importance of each function; but, in addition, they were asked to indicate the extent to which time they spent on each function was "about right," "too little," or "too much." Of the 116 superintendents included in the study, 102 or 88 percent responded. (Each of the Oklahoma superintendents was the chief administrator in districts maintaining grades 1-12.)

Responses from the jury of outstanding persons in school administration served as a body of authoritative opinion and a criterion against which the thinking and perceived practice of Oklahoma school superintendents could be measured.

Problem and Nature of This Study—The general problem of this study was to determine the relationship between the importance of administrative functions and the time expenditures of school superintendents relative to various administrative functions. Answers to several major questions were sought.

1. What is the relative importance of various administrative functions held by Illinois superintendents?
2. To what extent do the perceptions of importance regarding administrative functions held by Illinois elementary school superintendents agree with those held by experts in the field of school administration?
3. What is the relationship between the perceived time expenditures of Illinois superintendents relative to various administrative functions and their own concepts of the relative importance of various functions?
4. What is the relationship between the perceived time expenditures of Illinois superintendents relative to various administrative functions and the importance of various functions according to authoritative opinion?
5. Does the validity of perceived time expenditures of Illinois superintendents vary among schools in different categories of enrollment size?
6. How does the validity of perceived time and energy expenditures of Illinois superintendents compare with those of Oklahoma superintendents based on authoritative opinion?

In seeking answers to these questions, the study was limited to Illinois superintendents of separate elementary school districts. Superintendents of separate elementary school districts who were also serving as a superintendent of a separate high-school district were excluded. A twenty percent random sample of separate elementary districts, stratified by categories of school enrollment size, was selected for the study. Superintendents of 50 such school districts were invited to participate.

The study was in two parts. First, each of the 50 superintendents was sent a list of 38 functions and asked to indicate the importance of each function according to whether he felt it was "Extremely Important," "Significantly Important," "Moderately Important," or of "Little or No Importance." The list of functions used was identical to the one developed by Russell through a synthesis of the literature on educational administration in order that comparative data could be obtained. All 50 superintendents responded.

Secondly, after a superintendent had returned the first part of the study, he was forwarded another list of the same 38 functions and asked to indicate an evaluation of his own practices in regard to the time and energy expended relative to each function. Enough time was allowed to elapse between administration of the first and second parts of the study so that a respondent would be unlikely to recall his response to the first part. A superintendent did this by indicating for each function whether the time and energy he expended were "Too Much," "Too Little," or "About Right." All except two complete responses were received to the second part of the study. Due to the size of the sample, the manner in which the

sample was selected, and the number of responses to each part of the study, one is justified in confidently generalizing from the findings to all Illinois superintendents of separate elementary school districts.

Responses to each of the two parts of the study were collated separately by category of school enrollment size. Frequencies of response on importance of functions were assigned one of four weights, and frequencies of response on amount of time and energy were assigned one of three weights. Weighted ratings were converted into weighted scores for interpretative and statistical treatment and comparative purposes. Functions were ranked in degree of importance according to magnitude of the weighted scores thus derived. The same procedure was applied to responses on perceived time and energy expenditures.

Assumptions Underlying This Study—The present study is based on the assumptions that:

1. The evolving concepts relating to the functions of the superintendent of schools and their relative importance have not changed substantially since the opinions of experts in school administration were obtained in 1954.
2. The chief difference between the administration of a small school and a large one is not in the administrator's function but rather in the generalization of duties in the former and in their specialization in the latter.
3. The functions of the public school superintendent are substantially the same regardless of school size, community economic background or social structure, and number of grades maintained by the district.
4. The primary responsibility of the school superintendent is to develop a functional educational program through the exercise of leadership as a director or boss, a chairman of planning groups, a coordinator of services, and an educational statesman. In discharging this responsibility certain functions are present which must always be taken care of, regardless of the nature of the administrative process.

Relative Importance of Administrative Functions—Data are presented in Table I showing the rank order of functions by importance according to the jury of experts, Illinois elementary school district superintendents, and Oklahoma superintendents of schools. By reading the ranks from left to right opposite a given function it is possible to determine the relative importance of a function held by each of the two groups of school superintendents compared to the jury of experts. More than casual observation is needed to determine the extent to which functions deemed to be most important by the superintendents are also those functions held to be most important by outstanding school superintendents, professors of school administration, and authors composing the jury of experts. Rank difference coefficients of correlation showing the several relationships are presented in Table II. Schools with enrollments between 200-499, 500-999, and 1000 and over were classified respectively for this study as small, medium, and large.

Table II is to be interpreted in the following manner: The coefficient of correlation between the relative importance associated with the various administrative functions by any group of superintendents listed under Column (1) and either the jury of experts (Column 3) or Oklahoma superintendents (Column 2) may be determined by reading the number appearing under either of the latter two columns and opposite the group listed under Column (1). For example, the coefficient of correlation between all Illinois superintendents included in the study and the jury of experts on relative importance of various functions is .85.

Data presented in Table II reveal that the 102 Oklahoma school superintendents responding to the study agreed more closely with authoritative opinion than did the 50 Illinois elementary school district superintendents as to the relative importance of the various functions. However, a coefficient of .90 between the relative importance of functions held by Illinois superintendents compared with that indicated by Oklahoma superintendents shows a high degree of agreement between the two groups of superintendents. The most significant finding is probably the fact that when relationships are analyzed by categories of school size it is found that the relative importance associated with various functions by superintendents tends to increasingly diverge from authoritative opinion as school enrollment size decreases. The same trend is true to a lesser extent when relationships between what Oklahoma and Illinois school superintendents think important are considered.

In general, it can be concluded that school superintendents tend to substantially agree with the experts in school administration about the relative importance of various administrative functions. Illinois superintendents of smaller separate elementary school districts do not agree as closely with authoritative opinion about the relative importance of various administrative functions as do superintendents in larger similar districts. Russell[5] also found a similar tendency for judgments on the relative importance of various functions to vary among superintendents according to size of the community in which a school was located.

Relative Importance of Functions Grouped by Area—Although the 38 functions submitted to respondents were intentionally ungrouped all functions can be classified into one of nine area groupings. Average weighted ratings were found for all functions within each area classification or group-

TABLE I

FUNCTIONS RANKED ACCORDING TO IMPORTANCE BY JURORS, ILLINOIS ELEMENTARY SUPERINTENDENTS, AND OKLAHOMA SUPERINTENDENTS

Function of Superintendent	Rank by Jury	Rank by Illinois Elementary Superintendents	Rank by Oklahoma Superintendents
Employing of teaching, supervisory and administrative personnel	1.5	1.0	1.0
Guiding board of education in policy making	1.5	3.5	2.5
Preparing budget	5.0	3.5	2.5
Formulating school policies	5.0	8.0	5.5
Establishing and maintaining effective staff relationships	5.0	2.0	5.5
Planning long range building program	5.0	18.0	14.0
Reporting to the public	5.0	16.5	9.5
Delegating authority	9.5	14.5	9.5
Improving personal and professional qualifications of self	9.5	5.0	5.5
Providing leadership for in-service of staff	9.5	14.5	14.0
Evaluating school progress	9.5	6.0	14.0
Assigning, transferring, and dismissing personnel	12.5	16.5	5.5
Striving for democratic approach to problem solving	12.5	19.5	14.0
Initiating curriculum study and revision	14.0	9.0	20.0
Maintaining working relations with P. T. A. groups	15.5	22.0	20.0
Preparing of building plans	15.5	13.0	9.5
Supervising the improvement of instructions	17.0	7.0	9.5
Keeping operation of school in proper legal channels	18.5	11.0	14.0
Making contacts with civic, fraternal, and religious groups	18.5	24.0	22.5
Interviewing patrons and representatives of local organizations	20.0	27.5	24.5
Holding and attending workshops, clinics, institutes	21.5	25.0	27.5
Employing of clerks, custodians, other non-professional personnel	21.5	19.5	17.5
Preparing courses of study	23.5	12.0	20.0
Keeping proper records	23.5	10.0	17.5
Reporting to federal, state, and local authorities	25.0	23.0	30.0
Establishing proper rapport with public	26.0	21.0	24.5
Providing health examinations for pupils and employees	27.0	31.0	26.0
Supervising the maintenance of the school plant	28.0	27.5	22.5
Administering the transportation program	29.5	32.0	27.5
Supervising non-teaching employees	29.5	30.0	33.0
Taking of school census	32.0	37.0	33.0
Designing of record forms	32.0	36.0	37.0
Selecting library and other supplies	32.0	29.0	30.0
Purchasing general supplies (non-educational)	34.5	33.5	33.0
Supervising attendance	34.5	35.0	30.0
Administering lunch and other auxiliary programs	36.5	33.5	35.5
Dealing with pupil problems, including discipline	36.5	26.0	35.5
Teaching classes	38.0	38.0	38.0

TABLE II

RANK DIFFERENCE COEFFICIENTS OF CORRELATION BETWEEN IMPORTANCE OF ADMINISTRATIVE FUNCTIONS BASED ON AUTHORITATIVE OPINION AND IMPORTANCE INDICATED BY SCHOOL SUPERINTENDENTS

(1) Group of Superintendents	(2) Oklahoma Superintendents	(3) Jury of Experts
All Illinois Superintendents	.90	.85
Oklahoma Superintendents	1.00	.93
Illinois Superintendents (Small Schools)	.81	.74
Illinois Superintendents (Medium Schools)	.86	.83
Illinois Superintendents (Large Schools)	.92	.89

ing in order to determine which areas of an administrator's total task were deemed to be of greatest importance. Table III contains average weighted ratings by area of function for the jury of experts and both groups of superintendents. When the weighted ratings are interpreted according to the established categories it is evident that both groups of superintendents and the experts concur that functions related to the Board of Education are "Extremely Important." While the experts consider functions in the area of public relations to be "Extremely Important," both groups of superintendents indicate they consider them as only "Significantly Important." Both the experts and Illinois superintendents considered functions related to administration of personnel as "Significantly Important," while Oklahoma superintendents considered them "Extremely Important." Without including functions concerning the employment and supervision of non-teaching employees for experts and Oklahoma superintendents, the area of staff personnel administration would have an average weighted rating well above the minimum necessary to have been classified by them as "Extremely Important." One can conclude that functions relative to staff personnel are considered as one of the most important areas with which the administrator must be concerned.

All three groups concur that functions related to finance, buildings, and instruction are "Significantly Important." While the experts considered functions of a superintendent related directly to pupils and of a ministerial nature to be only "Moderately Important," both groups of superintendents rated them as "Significantly Important." Illinois superintendents and the experts agreed that functions classified as miscellaneous which included supervision of attendance, designing record forms, and administering transportation, lunch and other auxiliary programs were only "Moderately Important." Oklahoma superintendents indicated they were "Significantly Important."

The two areas of greatest discrepancy between degree of importance associated by Illinois elementary school district superintendents and the experts are those of public relations and pupil personnel administration.

Some insight into the nature of the difference between the jury of experts and Illinois superintendents on the relative importance of various areas of administrative functions can be obtained by noting the specific functions where there was a difference of five relative ranks or more between them. Below are listed the functions thought to be of greater importance by the experts than by Illinois superintendents:

Reporting to the public.
Striving for a democratic approach to problem solving.
Maintaining working relations with PTA groups.
Interviewing patrons and representatives of local organizations.
Making contacts with civic, fraternal, and religious groups.
Taking school census.
Providing leadership for in-service training of staff.
Planning long range building program.

All functions pertaining to the area of public relations appear to be considered more important by the experts. Functions accorded greater relative importance by Illinois superintendents than by the experts are listed below. The first three functions pertain to administration and improvement of the instructional program.

Initiating curriculum study and revision.
Supervising the improvement of instruction.
Preparing courses of study.
Keeping operation of school in proper legal channels.
Keeping proper records.
Establishing proper rapport with pupils.
Dealing with pupil problems, including discipline.

Whereas the experts placed a higher relative degree of importance than superintendents on "Providing leadership for in-service training of the staff," superintendents placed a higher relative importance than the experts on functions directly involving the administrator in personally bringing about curriculum improvement. The experts emphasize the leadership role of the administrator in providing and stimulating conditions related to staff improvement, whereas the administrators emphasized functions which would imply that the administrator would personally and directly bring about curricular improvement. Elementary school district superintendents placed a higher relative importance on functions relating to direct contact with pupils than did the experts.

Extent to which Superintendents Practice What They Know—Once having discovered the fact that, in general, school superintendents tend to agree with authoritative judgment about the relative importance of their various functions, it was then the task of the investigation to ascertain the extent to which the superintendents' perceived time and energy expenditures in practice coincided with what they seem to know is important. With reference to each function, superintendents indicated an evaluation of the adequacy of their own time and energy expenditures by indicating whether it was "too much," "too little," or "about right." The perceived practice has been analyzed in the light of general agreement on what is important in the task of educational administration as a superintendent of schools. An analysis of these data indicates the validity of time and energy expenditures of the

TABLE III

COMPARISON OF AVERAGE WEIGHTED RATINGS FOR EXPERTS AND SUPERINTENDENTS BY AREA OF FUNCTION

Area of Function	Average Weighted Ratings*		
	Jury of Experts	Illinois Superintendents	Oklahoma Superintendents
Board of Education	3.6	3.6	3.6
Public Relations	3.5	3.0	3.3
Personnel	3.4	3.4	3.5
Buildings	3.3	3.1	3.4
Instruction	3.2	3.3	3.3
Finance	2.6	2.9	3.1
Ministerial	2.4	2.8	3.0
Pupils	2.0	2.5	2.7
Miscellaneous	1.9	2.3	2.7

*For purposes of interpretation, numerical categories of weighted ratings were established as follows:

0.0 - 1.4	Little or No Importance
1.5 - 2.4	Moderately Important
2.5 - 3.4	Significantly Important
3.5 - 4.0	Extremely Important

school superintendent in terms of what is important. These data are presented in Table IV which is to be interpreted as follows: The relationship between relative importance of various functions and the perceived amount of time and energy expenditures as indicated by all Illinois superintendents included in the study is -.48. This means that functions considered by these superintendents as having the greatest importance tend to have "too little" time and energy spent on them by these same superintendents and that functions of lesser importance tend to have "too much" time and energy expended on them.

Coefficients of rank difference correlation presented in Table IV indicate a significant inverse relationship exists between importance of functions according to the superintendents' and jury of experts' views about the relative importance of various functions and the time and energy expenditures relative to them. These data indicate that, as perceived by superintendents, too little time and energy on the job are devoted to the functions which both they and the experts tend to agree are of greatest importance. Too much time and energy are expended on functions of lesser importance. These facts were also found to be true of Oklahoma superintendents to a degree.

When analyses were made considering school size, it appears that this condition is more true among superintendents of schools with small enrollments than for those of medium or large size. It appears also that superintendents of schools with medium size enrollments tend to devote more time and energy to functions deemed to be of greatest importance than do superintendents in the other two enrollment size categories.

Functions Receiving "Too Little" Time and Energy—These significant findings prompted further analyses concerning the relationships between functions in regard to which superintendents indicated they were expending "too little" time and energy. Functions were ranked on which "too little" time and energy were being expended according to extent to which this was true. The ten top ranked functions on which Illinois superintendents indicated "too little" time and energy were being spent are listed below in rank order of mention:

1. Supervising the improvement of instruction.
2. Providing leadership for in-service training of staff.
3. Evaluating school progress.
4. Reporting to the public.
5. Improving personal and professional qualifications of self.
6. Preparing couses of study.
7. Initiating curriculum study and revision.
8. Holding and attending workshops, clinics, institutes.
9. Establishing proper rapport with pupils.
10. Formulating school policies.

Observation of the listing reveals that such functions are largely concerned with evaluation, curriculum development and improvement, staff and self-improvement, and relationships with the public and pupils.

Table V contains rank difference coefficients of correlation between the importance of various functions and the extent to which superintendents perceive that they devote "too little" time and energy. Data indicate that functions on which superintendents devote "too little" time and energy are those that tended to have been deemed by both experts and Illinois superintendents as most important. Again there is evidence that Illinois superintendents of medium size schools tend more than those of large and small ones to devote "too little" time and energy to a lesser extent to more important functions. The difference between the coefficients of correlation for all Illinois and Oklahoma superintendents was found to be significant at the 5 percent level of significance. This would indicate that Illinois superintendents, more than Oklahoma superintendents, perceived that they devoted "too little" time and energy to functions deemed to be of greatest importance.

Functions Receiving "Too Much" Time and Energy—Functions concerning which Illinois superintendents indicated they devote "too much" time and energy were ranked in descending order according to the frequency with which superintenddents had indicated "too much." Following are listed the ten most frequently mentioned functions with reference to which superintendents perceive they devote "too much" time and energy:

1. Reporting to federal, state, and local authorities.
2. Administering lunch and other auxiliary programs.
3. Supervising the maintenance of the school plant.
4. Purchasing general supplies (non-educational).
5. Supervising non-teaching employees.
6. Keeping proper records.
7. Dealing with pupil problems, including discipline.
8. Designing of record forms.
9. Preparing of building plans.
10. Administering the transportation program.

Rank difference coefficients of correlation are presented in Table VI to indicate the relationship between the relative importance of administrative functions according to both the jury of experts and Illinois superintendents, and the functions concerning which superintendents perceive they devote "too much" time. Significant inverse relation-

TABLE IV

RANK DIFFERENCE COEFFICIENTS OF CORRELATION BETWEEN IMPORTANCE OF ADMINISTRATIVE FUNCTIONS AND TIME AND ENERGY EXPENDITURES FOR SUPERINTENDENTS

(1) Groups Determining Importance of Functions	(2) Amount of Time and Energy Expenditures			
	All Illinois Superintendents	Illinois Superintendents Large Schools	Ill. Supt. Medium Schools	Illinois Superintendents Small Schools
All Illinois Superintendents	-.48*			
Jury of Experts	-.51*	-.44*	-.39**	-.53*
Oklahoma Superintendents	-.43*	-.36**	-.32**	-.48*
Illinois Superintendents (Small Schools)				-.42*
Illinois Superintendents (Medium Schools)			-.39**	
Illinois Superintendents (Large Schools)		-.40**		

* Statistically significant at the 1% level of significance.
**Statistically significant at the 5% level of significance.

TABLE V

RELATIONSHIPS BETWEEN IMPORTANCE OF FUNCTIONS AND EXTENT TO WHICH ADMINISTRATORS DEVOTE "TOO LITTLE" TIME AND ENERGY ON FUNCTIONS

	Functions Which Receive "Too Little" Time and Energy by Group				
Groups Determining Importance of Functions	Oklahoma Supts.	All Illinois Supts.	Ill. Supts. Small Schools	Ill. Supts. Medium Schools	Ill. Supts. Large Schools
Jury of Experts	.46*	.55*	.51*	.39**	.54*
All Illinois Superintendents		.52*			

* Statistically significant at the 1% level of significance.
**Statistically significant at the 5% level of significance.

TABLE VI

RELATIONSHIPS BETWEEN IMPORTANCE OF FUNCTIONS AND EXTENT TO WHICH ADMINISTRATORS DEVOTE "TOO MUCH" TIME AND ENERGY ON FUNCTIONS

	Functions Receiving "Too Much"				
Importance by Group	Oklahoma Supts.	All Illinois Supts.	Ill. Supts. Small Schools	Ill. Supts. Medium Schools	Ill. Supts. Large Schools
Jury of Experts	-.53	-.52	-.47	-.46	-.31*
All Illinois Superintendents		-.53			

*Significant at the 5% level; all other coefficients significant at the 1% level.

ships are found between what both Illinois superintendents and experts consider as the most important functions and those on which it is perceived that "too much" time is being spent. It appears that as school enrollment size increases, the frequency with which "too much" time and energy are expended on functions of lesser importance decreases. There appears to be no significant difference between the frequency with which Oklahoma and Illinois superintendents devote "too much" time and energy to functions of lesser importance.

Superintendents perceive the time and energy expended in regard to certain functions are "about right." Functions with respect to which the largest number of superintendents indicated their time and energy expenditure were "about right" are listed below in descending order of frequency with which they were mentioned:

1. Employing of clerks, custodians, other non-professional personnel.
2. Assigning, transferring, and dismissing personnel.
3. Keeping operation of school in proper legal channels.
4. Supervising attendance.
5. Preparing budget.
6. Maintaining working relations with PTA groups.
7. Interviewing patrons and representatives of local organizations.
8. Providing health examinations for pupils and employees.
9. Purchasing general supplies (non-educational).
10. Taking of school census.
11. Employing of teaching, supervisory, and administrative personnel.
12. Selecting library and other supplies.
13. Delegating authority.

More than three of every five superintendents perceived their practice as "about right" in time and energy expenditures for each of the functions listed. While the function of purchasing non-educational supplies was high among the functions on which administrators indicated they were devoting "too much" time and energy, it appears ninth in order among the functions in regard to which, in general, time and energy expenditures are indicated as being "about right." This is the only function of high rank order duplicated among the three listings, and all three listings of high rank functions contain all but six of the 38 functions. Thus it appears that there is distinct general agreement among participating Illinois superintendents concerning the evaluation of administrative practice relative to the various functions.

Relationship Between Relative Importance of Administrative Functions Based on Authoritative Judgment and Perceived Time and Energy Expenditures of Illinois Superintendents—Graphical pictures of the relationship between authoritative opinion on importance of functions and relative adequacy of time and energy expenditures for each function in two area classifications where the divergence was greatest are presented for Illinois superintendents. A similar picture was portrayed by Oklahoma administrators. This will reveal at a glance the extent to which practice regarding time and energy expenditures coincides with relative importance of items. Relative rank order percentile positions of relative importance were ascertained for each function, and they are indicated by the top bar opposite a function in each instance. A similar procedure relative to amount of time and energy expenditures was used as a basis for the second bar opposite each function. Graphical presentations of these relationships for other areas of function have by necessity been omitted due to space limitations.

Instruction—While, as indicated in an earlier portion of this report, experts considered the provision of leadership by administrators for the in-service training of the staff as being of higher relative importance than did superintendents, Figure 1 indicates relatively little time and energy are expended on this function compared to its position of importance. In general, this relationship is true for all functions related to the area of instruction. These data indicate that in terms of the importance of administrative functions related to the instructional program, school superintendents might well examine their present practices in the light of the total task with a view of increasing the time and energy expended on this vital area of functions.

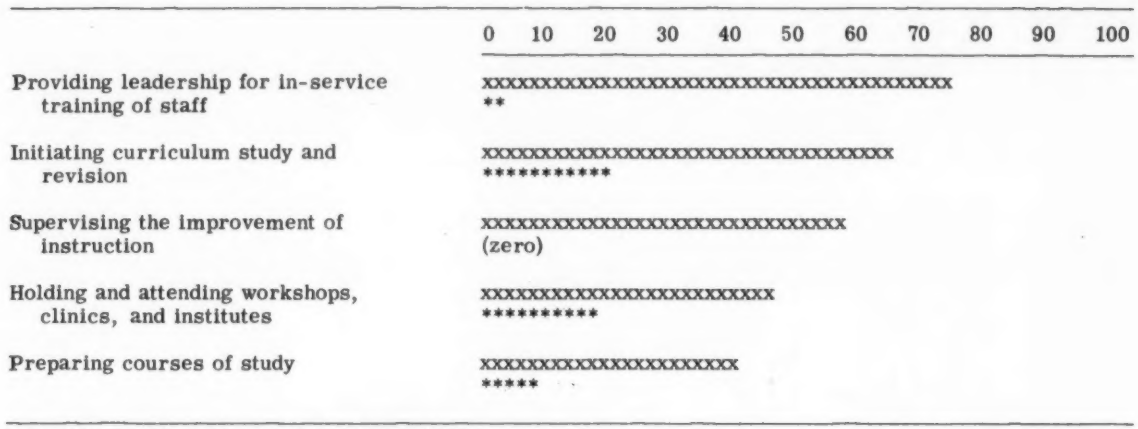
Ministerial and Miscellaneous—As shown in Figures 2 and 3, compared to relative importance of specific functions in these two areas, a disproportionate amount of time and energy are expended on each function so classified. The most exorbitant expenditure of time and energy in relation to relative importance of functions is in relation to supervising attendance, designing record forms, completing reports to federal, state, and local authorities and administering lunch and other auxiliary programs. Keeping records, taking school census and administering the transportation program all receive a disproportionate amount of time and energy to a lesser degree.

Summary of the Findings—Data obtained in this study are summarized below to identify concisely the major findings:

1. City school superintendents in Oklahoma and Illinois superintendents of separate elementary school districts agree closely with each other

FIGURE 1

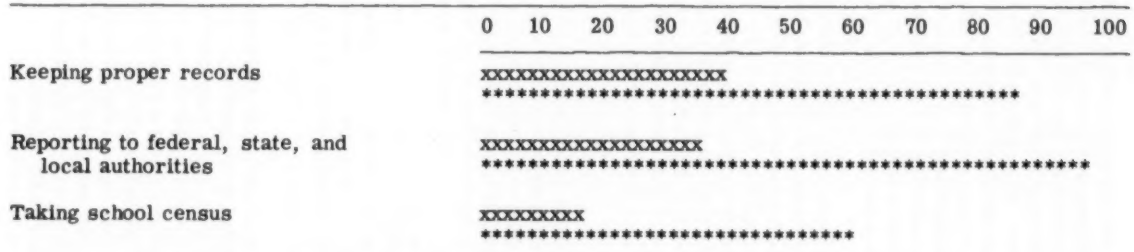
RELATIONSHIP BETWEEN IMPORTANCE OF FUNCTIONS RELATED TO INSTRUCTION AND TIME AND ENERGY EXPENDITURES



xxxx Percentile rank of relative importance.
**** Percentile rank of relative expenditure of time and energy.

FIGURE 2

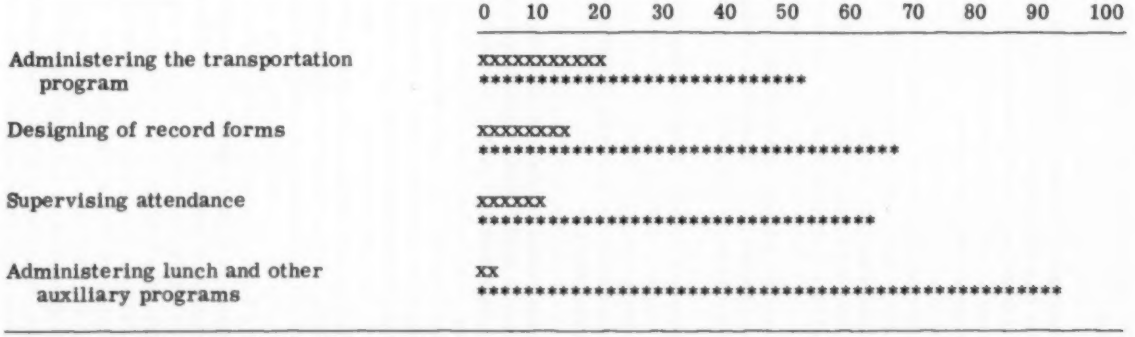
RELATIONSHIPS BETWEEN MINISTERIAL FUNCTIONS AND TIME AND ENERGY EXPENDITURES



xxxx Percentile rank of relative importance.
**** Percentile rank of relative expenditure of time and energy.

FIGURE 3

RELATIONSHIPS BETWEEN MISCELLANEOUS FUNCTIONS AND TIME AND ENERGY EXPENDITURES



xxxx Percentile rank of relative importance.
**** Percentile rank of relative expenditure of time and energy.

and with the opinions of authorities in the field of school administration about the relative importance of various administrative functions. However, Oklahoma superintendents agreed more closely with authoritative opinion on relative importance of various administrative functions of a superintendent than did Illinois separate elementary school district superintendents.

2. As school district enrollment increases, opinions of school superintendents in both Illinois and Oklahoma were found to agree more closely with those of authorities on relative importance of administrative functions.

3. Both groups of superintendents and the experts concur that administrative functions related to the board of education are of greatest relative importance or "extremely important" and that functions related to personnel administration are "significantly important." The experts consider public relations functions to be of higher relative importance than do either group of superintendents.

4. Superintendents concur in associating a higher degree of relative importance to functions related to pupils, finance, certain miscellaneous functions, and ministerial functions than do the experts.

5. The two areas of greatest discrepancy between experts and Illinois superintendents are public relations and pupil personnel administration. Experts associated greater relative importance than did superintendents with public relations functions, and the converse was true of pupil personnel administration.

6. The experts associated a higher relative degree of importance with the superintendent's leadership function relating to staff improvement than superintendents, and superintendents associated a higher relative degree of importance than experts on functions directly involving them in personally bringing about curriculum improvement through initiating curriculum study and revision, preparing courses of study, and supervising the improvement of instruction.

7. As perceived by both groups of superintendents, relatively too little time and energy are devoted to administrative functions which both they and the experts agree are of greatest relative importance and too much time and energy are expended on functions of lesser importance. These conditions are more true for Illinois superintendents of schools of small enrollments than for those of medium or large size.

8. Superintendents of medium size separate Illinois elementary school districts perceive they devote relatively more time and energy to functions deemed to be of greatest relative importance than superintendents in districts of either small or large size enrollments perceive they devote to such functions.

9. Half of the ten top ranked functions on which Illinois superintendents perceive they are devoting relatively "too little" time and energy pertain to administration of the instructional program. Another such function relates to the administrator's function of improving his own personal and professional qualifications. Another pertains to reporting to the public and two, formulating school policies and evaluating school progress, are functions relating to the Board of Education.

10. Illinois elementary school district superintendents, more than Oklahoma superintendents perceive they devoted "too little" time and energy to functions deemed by the jury and themselves as being of greatest relative importance, but there appeared to be no such difference between the two groups of superintendents concerning items on which relatively "too much" time and energy are expended in terms of relative importance of functions.

11. Functions concerning which Illinois superintendents perceive they are devoting relatively "too much" time and energy are primarily ministerial and miscellaneous in nature. These functions include those of keeping records, purchasing non-educational supplies and supervising non-teaching employees, designing record forms, completing reports to various governmental authorities, supervising school plant maintenance, dealing with pupil problems and administering lunch, transportation, and other auxiliary programs.

12. Comparative analysis of percentile rank positions of function importance and relative time and energy expenditures of Illinois superintendents reveals that functions related to instruction are the ones where there is the greatest consistent expenditure of relatively "too little" time and energy in terms of relative importance accorded functions by the experts. This is generally true of functions related to the Board of Education.

13. Comparative analysis of percentile rank position of function importance and relative time and energy expenditures of Illinois superintendents reveals the ministerial and miscellaneous area of functions to be those where there is the greatest consistent expenditure of

relatively "too much" time and energy in terms of relative importance accorded functions by the experts.

Conclusions and Implications—Based upon the findings of this study, the investigators have reached certain conclusions and drawn pertinent implications as follows:

1. Perceptions of importance held by Illinois elementary school superintendents regarding relative importance of administrative functions substantially agree with those held by experts in the field of school administration.

2. Superintendents of schools know which of their functions are of most importance, but for some reason in practice they are either thwarted from devoting greatest attention to the most important aspects of the task of school superintendent, tending without realizing it, to feel more secure in concerning themselves with functions requiring less educational statesmanship, or by choice are reluctant to concern themselves with tasks of greatest importance which involve higher degrees of risk in successfully accomplishing them. Further study is needed to reveal the causal factors.

3. There is a statistically significant inverse relationship between functions accorded greatest importance by Illinois elementary school superintendents and their perceived time and energy expenditures relative to those functions. This is true also concerning what authorities consider as important.

4. The validity of time and energy expenditures of Illinois separate elementary school district superintendents decreases as school enrollment size diminishes, based on authoritative opinion.

5. Increased divergence of agreement on the relative importance of a school superintendent's functions between experts and superintendents and validity of time and energy expenditures which are associated with size of school may be attributed to the more generalized nature of administrative function as school size decreases, to the lesser amounts and quality of training and experience of persons employed in smaller schools, or possibly to the fact that relative importance of functions may actually vary according to enrollment size of the school.

6. The validity of perceived time and energy expenditures among Illinois administrators included in the study is less than for Oklahoma school superintendents based upon authoritative opinion, particularly with reference to time and energy expenditures related to functions considered of greatest relative importance, namely, the area of instruction.

7. Illinois superintendents of separate elementary school districts could profitably re-examine the manner in which they are discharging the task of school administration particularly with reference to their functions relating to the Board of Education and administration of the instructional program.

8. Not only do the results of this study point to the desirability for practicing Illinois superintendents to re-examine their practices in regard to administrative functions, but they also have implications for the content and emphases found in college or university administrator preparation programs.

9. Based on authoritative judgment, elementary school superintendents could profitably reconsider the importance of public relations functions and their role as administrator in the improvement of instruction and the curriculum.

10. The writers conclude that similar findings would have been obtained if every separate elementary school district superintendent in Illinois had participated in the study, and they suspect the picture would be little different if superintendents of unit or separate secondary school districts had been included. Improvement of educational administrative practice is the responsibility of both the practicing administrator and the researcher who may probe more deeply into the obstacles and causal factors surrounding the condition where greatest attention is devoted to functions of lesser importance with a view to re-orienting emphasis of effort.

11. The findings of this study precipitate questions concerning basic characteristics of the structure within which the system of public education is provided. Is there a "best" size of school organization within which the chief executive is most able to function as a professional leader in accomplishing the task? Is it possible that the basic organizational structure, within which the school exists, can facilitate or hinder the most effective performance of the chief executive in terms of the real purpose for which public schools have been established? Theoretically, assuming that three superintendents with identical training, experience, competencies, abilities, and motivations secured positions in large, medi-

um, or small size school systems, respectively, in communities with identical characteristics, is it possible that with equal effort one can be more effective than the other two in discharging this task of educational leadership because of more favorable conditions associated with differences in basic organizational structure?

FOOTNOTES

1. J. K. Norton, "Meeting the Challenges to Educational Administration," Teachers College Record, LII (May 1951), pp. 467-8.
2. American Association of School Administrators, Yearbook (Washington, D. C., 1933), pp. 135-42.
3. American Association of School Administrators, The American School Superintendency, 13th Yearbook (Washington, D. C.: The Association, 1952), p. 293.
4. R. R. Russell, A Study of the Relationship Between the Importance of Administrative Functions and Time Expenditure of School Superintendents, Based on Authoritative Judgment, unpublished Ph. D. dissertation, Oklahoma A and M College, Stillwater, 1954.
5. Ibid., p. 77.

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A COMPARATIVE STUDY OF STUDENT-TEACHING PRACTICES IN THIRTY-EIGHT MIDWEST INSTITUTIONS

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Introduction—Background and Sample

AS ONE MEANS of evaluating its program of student teaching, the School of Education of Northwestern University recently became interested in analyzing student-teaching programs of other selected colleges and universities in the midwest area. Accordingly, in December of 1957, a questionnaire was mailed to the other Big Ten Universities and to 43 additional institutions of higher learning in the states of Illinois and Indiana. The 43 deans, chairmen of departments of education, and directors of student teaching whose names appeared in the Thirty-Sixth Yearbook, 1957, of the Association for Student Teaching, and the deans or directors of student teaching of the Big Ten Universities comprised the mailing sample.

Of the 52 institutions which received questionnaires, replies were returned by 39, or 75 percent. One reply was too incomplete to use, leaving a working sample of 38. Returns were as follows: 8 of the 9 Big Ten Universities returned questionnaires, 10 of the 11 other universities, all 5 of the teachers colleges (3 state and 2 private), and 15 of the 27 liberal-arts colleges. The respondent sample consists of 18 universities, 5 teachers colleges, and 15 liberal-arts colleges. Of the 27 institutions in Illinois which were contacted, 21 returned completed questionnaires; of the 16 in Indiana, 10 made returns. From this point on in the study, no distinction will be made among the institutions on the basis of location by state.

Enrollments for the year 1957-58 in the 38 institutions were listed as follows: 15 thousand or more, 6 institutions; 11-13 thousand, 2; 7-9 thousand, 1; 5-7 thousand, 4; 3-5 thousand, 4; 2-3 thousand, 3; 1-2 thousand, 3; 500-1 thousand, 12; and under 500, 3.

Mean average student teaching enrollments on hand and projected for the remainder of the year 1957-58 were listed as follows: 250 elementary and 430 secondary for the Big Ten schools, 86 elementary and 176 secondary for the other universities, 174 elementary and 247 secondary for the liberal-arts colleges, and 113 elementary and 195 secondary for all colleges and universities. The total for all institutions was 4078 elementary student teachers and 6421 secondary.

All but one of the 38 institutions, a liberal-arts college, had a program of elementary education; all but two, both teachers colleges, had a program of secondary education.

Ten of the 18 universities, 4 of the 5 teachers colleges, and 1 of the 15 liberal-arts colleges had laboratory schools at the elementary level; 10 of the 18 universities, 2 of the 5 teachers colleges, and 4 of the 15 colleges had laboratory schools at the secondary level. Totals were 15 for elementary and 14 for secondary.

The Purpose

The purpose of the study was to discover and evaluate existing practices in the program of student teaching of other institutions of higher learning to the possible and of making changes in the program of the School of Education of Northwestern University in areas where changes seemed warranted. In brief, the study was intended as a stimulus for a more effective program evaluation. Information was requested in an effort to determine comparative practices in the following facets of the student-teaching program.

1. How many credit hours of student teaching are required or permitted by the colleges and universities which responded to the questionnaire?
2. What basic patterns of student teaching are followed: hours per day, days per week, and number of weeks?
3. How many secondary-school students have experiences in both their major and minor fields of subject matter?
4. What kinds of compensation are made to public and private-school personnel who cooperate in the program?
5. How are cooperating teachers selected?
6. How adequate are cooperating teachers believed to be?
7. How are students screened prior to accept-

ance for student teaching?

8. What practices are followed prior to student teaching in getting students acquainted with children and youth?

Data pertaining to the role of the college supervisor and an overall evaluation of the 38 programs of student teaching will be published at a later date. The length of the questionnaire and complexity of some of the returns led the investigator to report the findings in several rather than one manuscript.

The Findings of the Study

Credit hours of student teaching. One of the current problems of teacher education is to determine how many hours of student teaching should be required. To discover existing practices among the various colleges and universities, the investigator included the following item in the questionnaire:

"Within the framework of an undergraduate-degree program, please list in the following table the number of credit hours of student teaching required for graduation. If additional hours of student-teaching enrollment are permitted, please write in the number of hours for each year of school as indicated. If student-teaching is a senior-year experience for a majority of students, but a small minority are enrolled in it during the junior year, list it in the senior year only."

The data which were received in response to the item are presented in Table I.

The most distinguishing feature of the data is their variability. The required hours of student teaching have a range from 5 to 21 quarter hours in elementary and 5 to 15 hours in secondary. The Big Ten Universities are at the top in elementary and secondary for both mean and median hours, followed in rank order by the teachers colleges, other universities, and liberal-arts colleges. The School of Education of Northwestern University requires 16 quarter hours of student teaching at both the elementary and secondary levels.

In addition to the required hours listed in Table I, the mean number permitted on an optional basis is 2.11 quarter hours at the elementary and 2.26 at the secondary level. The Big Ten Universities permit on an optional basis 1.74 quarter hours at the elementary and 1.69 at the secondary level; other universities, 1.90 and 3.10 respectively; teachers colleges, 3.40 and 2.66; and liberal-arts colleges, 2.03 and 1.90.

When mean required and additional hours are combined, it may be observed that at the elementary level, the mean averages are as follows: Big Ten, 14.81 quarter hours; other universities, 13.45; teachers colleges, 15.50; and liberal-arts colleges, 10.85. At the secondary level, totals are 12.00, 12.50, 14.49, and 9.97 respectively.

Hourly, daily and weekly pattern of student teaching. Of interest to the investigator was the time pattern which the various institutions followed in their student-teaching programs. Data were returned as presented in Table II.

It is to be noted from the last line of Table II that the dominant pattern of student teaching at both the elementary and secondary levels is a half-day experience: 19 of the 38 institutions at the elementary and 15 of the 36 at the secondary level follow this pattern. Next in quantitative importance is the full-day program with totals of 9 and 8 respectively. Six at the elementary level follow both patterns; 6 and 2 respectively are on a 2 hour per day basis; 3 secondary on a 1 hour basis; and 1 secondary on a 3/4 hour basis. All but two institutions have student teaching five days weekly.

The range in terms of weeks of student teaching is varied depending on whether the institution is on a full-day, half-day, or some other organizational basis. The range at the elementary level is 9-27 weeks; at the secondary, 8-32. The range for the full-day program is 6 to 14 weeks with only one university on a 6 week plan; all others were on a 9 to 14 week plan.

Of interest is the fact that only minor organizational differences exist between the elementary and the secondary programs in terms of hours per day, days per week, and number of weeks of student teaching. The program of the school of Education of Northwestern University reflects the same minor differences. The basic pattern is a full-day program for 11 weeks, 5 days per week. However, more full-day students proportionately are accepted in the secondary than in the elementary program. The impact of an inadequate full-day student teacher at the elementary level in a self-contained classroom is so great that many students are encouraged to enroll in the half-day program for two quarters.

Student teaching in the major and minor fields. One of the controversial areas in the field of secondary education is whether students should be graduated with teaching competencies in one field or in several; and if in several, whether these competencies should be demonstrated in a student-teaching situation. The questionnaire item which related to this problem elicited responses as indicated in Table III.

An analysis of Table III indicates that the tendency of most student teachers, 68.21%, who are enrolled in the 36 institutions which have secondary programs is to teach only in their major fields. The liberal-arts colleges lean most heavily in the direction of specialization whereas the Big Ten schools are the least prone to narrow student teaching horizons to only a major area of concentration. By the same logic, 45.86% of the secondary students in Big Ten schools have a practical experience in both the major and minor fields whereas only 17.8 % of the student teachers in liberal-arts colleges have a similar experience.

TABLE I

QUARTER HOURS OF STUDENT TEACHING

School	Elementary			Secondary		
	Mean Reqs.	Median Reqs.	Range	Mean Reqs.	Median Reqs.	Range
Big Ten Universities	13.07	12.33	7.5-19	10.31	10.5	7.5-15
Other Universities	11.55	11.75	5.21	9.4	9.75	5-12
All Universities	12.23	11.95	5.21	9.81	10.10	5-15
Teachers Colleges	12.10	12.00	8-15	9.83	12.00	8-13.5
Liberal-Arts Colleges	8.82	7.35	7-15	8.07	7.01	6-15
All Colleges	9.60	7.90	7-15	8.47	9.55	6-15
All Institutions	10.83	10.15	5-21	9.09	9.80	5-15

TABLE II

TIME PATTERN FOR STUDENT TEACHING

Schools	Hours per Day		Days per Week		No. of Weeks	
	Elem.	Second.	Elem.	Second.	Elem.	Second.
Big Ten Universities	3 f. d. 4 h. d. 1 No Ans.	3 f. d. 2 h. d. 1-2 hr. 1-1 hr. 1 No Ans.	All 5 d.	All 5 d.	10-20	8-32
Other Universities	5 f. d. 5 h. d. 2 b.	3 f. d. 5 h. d. 1-2 hr. 1-3/4 hr.	All 5 d.	All 5 d.	9-24	9-18
All Universities	6 f. d. 9 h. d. 2 b. 1 No Ans.	6 f. d. 7 h. d. 2-2 hr. 1-1 hr. 1-3/4 hr. 1 No Ans.	All 5 d.	All 5 d.	9-25	8-32
Teachers Colleges	1 f. d. 1 h. d. 3 b.	1 f. d. 2 h. d. 2 No Pgm.	1-4 1/2 d. 1-3 d. 3-5 d.	1-2 d. 2-5 d.	12-27	8-19
Liberal-Arts Colleges	2 f. d. 9 h. d. 1 b. 2-2 hr. 1 No Ans.	1 f. d. 6 h. d. 4-2 hr. 2-1 hr. 2 No Ans.	All 5 d.	All 5 d.	9-18	9-18
All Colleges	3 f. d. 10 h. d. 4 b. 2-2 hr. 1 No. Ans.	2 f. d. 8 h. d. 4-2 hr. 2-1 hr. 2 No Ans.	18-5 d. 1-4 1/2 d. 1-3 d.	17-5 d. 1-2 d. 2 No Pgm.	9-27	8-19
All Institutions	9 f. d. 19 h. d. 6 b. 2-2 hr. 2 No Ans.	8 f. d. 15 h. d. 6-2 hr. 3-1 hr. 1-3/4 hr. 5 No Ans.	36-5 d. 1-4 1/2 d. 1-3 d.	35-5 d. 1-2 d. 2 No Pgm.	9-27	8-32

Legend: f. d. = full day; h. d. = half day; b. = both full day and half day; No Pgm.= No Program.

TABLE III

STUDENT TEACHING IN THE MAJOR AND MINOR FIELDS

Schools	Major Only	Minor Only	Both
Big Ten Universities	52.00%	2.14%	45.86%
Other Universities	63.89	1.22	34.89
All Universities	58.69	1.63	39.68
Teachers Colleges	68.33	1.67	30.00
Liberal-Arts Colleges	78.37	3.83	17.80
All Colleges	76.67	3.50	19.83
All Institutions	68.21	2.61	29.18

At Northwestern University, student teachers who are under the auspices of the school of Education have experiences in both the major and minor fields, with the exception of students in the areas of art, home economics and business education. In general, members of the staff of the School of Education favor breadth of teaching preparation; of the staff of the liberal-arts college, more specialized preparation.

Compensation to the cooperating schools. How many colleges and universities pay teachers or school systems for the services which they render the student teaching program? How many, and in what way, do institutions compensate other than by monetary payments to teachers or school systems? Answers were sought to these and other related questions about compensation for student teaching services which are performed by those public and private schools which cooperate in the teacher-education programs of the 38 respondent institutions. Pertinent findings are contained in Table IV.

Of the 38 institutions which returned usable questionnaires, 28 indicated that they made direct payments to classroom teachers for services rendered. As indicated in line 1 of Table IV, the mean average payments per quarter hour of student teaching time ranged from $1.33 to $11.00 with a mean average of $6.06 for all institutions. The median was $5.08. The Universities paid an average of $6.81 and the colleges, $5.31.

The mean institution of the sample with a student teaching enrollment of 113 elementary and 195 secondary students scheduled for a mean of 10.83 and 9.09 required hours of student teaching respectively would pay to cooperating teachers a total of $18,157 per year.

Two schools, both teachers colleges, make a payment to the school system, not to the teachers themselves. These two along with 28 that make a direct payment to teachers leave only 8 of the 38 institutions which do not pay either teachers or the school board.

As may be noted in Table IV, 6 institutions gave tuition benefits of some kind to the cooperating teachers or schools; 20 extended library privileges; 10 permitted cooperating teachers to attend special events at the college or university, and 10 listed the names of teachers in the college catalog. One institution which makes no direct payments to teachers or a school board stated that it had $90,000 to $120,000 per year for tuition benefits to teachers in the cooperating school systems for in-service purposes, workshops and professional meetings.

Other miscellaneous methods of compensation were listed as follows, with parenthetical figures indicating the number of institutions which used the specific medium: pay principal (1), give dinners (4), give teas (2), make union facilities available (1), provide equipment (2), subscribe to professional journals for teachers and schools (2), finance workshops (2), invite teachers to staff meetings (1), and charge a tuition fee of $10.00 per student which goes to the teacher (1).

Northwestern University makes no direct payment to teachers but extends limited tuition benefits, gives faculty rates to teachers for special events, extends library privileges, and includes cooperating personnel on its mailing list.

How are cooperating teachers selected? A problem that regularly seems to plague teacher-education institutions is how to discover before the fact whether a teacher is likely to be an effective cooperating teacher. To get acquainted with comparative practices, the following item was included in the questionnaire:

What methods do you use in selecting cooperating teachers? After each method listed, please indicate how effective the method is by placing a check under one of the four listed symbols: V. E. for very effective, M. E. for moderately effective, M. I. for moderately ineffective, and V. I. for very ineffective.

Responses to the item are presented in Table V. Symbols are employed as indicated above.

From the data in Table V, no conclusions may be reached about the best way or ways of selecting supervising teachers. The majority of institutions, 31, seem to permit school officials to help select cooperating teachers; 24 visit classrooms; and a small minority use other methods. Northwestern University is likewise perplexed over the problem of how to select capable cooperating teachers. Apparently only after an institution has worked with a teacher for an extended period of time can it be reasonably certain about the accuracy of the original selection.

How competent are supervising teachers? Did the 38 institutions believe that they were working with reasonably competent classroom teachers in their student teaching programs? The data in Table VI, at least in part, provide the answers.

The implications of Table VI are encouraging. In the opinion of the respondents, a vast majority of the cooperating teachers are believed to meet high standards or to do an adequate job. Interesting is the fact that the declared adequacy of the classroom teacher seems to vary but little whether he works with a student teacher from a university, a teachers college, or a liberal-arts college. Also of interest is the fact that little difference exists between the declared competency of elementary and secondary-school teachers. The over-all picture is as follows: in the elementary field, 92.7 percent were believed to meet high standards regularly or to do an adequate job; in the secondary field, 91.6 percent were identified as meeting these same standards. The Big Ten Universities were the most pessimistic, labeling 12.2 percent of the secondary school teachers as less than ade-

TABLE IV

COMPENSATION TO COOPERATING SCHOOLS AND PERSONNEL

	Big Ten	Other Uni.	All Uni.	Teachers Colleges	Lib.-Arts Colleges	All Colleges	All Inst.
Direct payment per quarter hour of student teaching.	$5.61[6] (4.16-7.50)	$7.83[7] (5.00-11.00)	$6.81	$8.50[2] (7.00-10.00)	$4.82[13] (1.33-10.00)	$5.31	$6.06[28]
No. of schools which extend library privileges.	4	3	7	5	8	13	20
No. of schools which give tuition benefits.	3	0	3	0	3	3	6
No. of schools which permit teachers to attend special activities at faculty rates.	1	2	3	1	6	7	10
No. of schools which list co-operating teachers' names in college catalog.	1	3	4	3	3	6	10

Note: Line one is to be interpreted as follows: $5.61, for instance, represents the mean payment made by Big Ten schools per quarter hour of student teaching; the exponents 6, 7, 2, 13 and 28 tell the number of Big Ten schools which pay; and the numbers in parentheses give the range.

TABLE V

METHODS OF SELECTING SUPERVISING TEACHERS

	Big Ten	Other Uni.	All Uni.	Teachers Colleges	Lib.-Arts Colleges	All Colleges	All Inst.
Selected directly by cooperating school officials.	3 VE 4 ME 1 MI	2 VE 5 ME	5 VE 9 ME 1 MI	1 VE 3 ME	8 VE 4 ME	9 VE 7 ME	14 VE 16 ME 1 MI
University personnel visit classrooms.	3 VE 4 ME	5 VE 1 ME	8 VE 5 ME	5 VE	5 VE 1 ME	10 VE 1 ME	18 VE 6 ME
Recommended by colleagues, teachers.				1 ME	1 VE 1 ME	1 VE 2 ME	1 VE 2 MI
Follow policies and standards of state department.	2 ME		2 ME	1 ME 1 MI	1 ME	2 ME 1 MI	4 ME 1 MI
Use teachers who volunteer	1 VE	1 ME	1 VE 1 ME	1VE	1 VE	2 VE	3VE 1 ME
Use teachers who are recommended by students.				1 VE 2 ME	1 MI	1 VE 2 ME 1 MI	1 VE 2 ME 1 MI

Legend: VE = very effective; ME = moderately effective; MI = moderately ineffective; VI = very ineffective.

TABLE VI

HOW COMPETENT SUPERVISING TEACHERS ARE BELIEVED TO BE

		Big Ten	Other Uni.	All Uni.	Teachers Coll.	Lib. Arts Coll.	All Coll.	All Inst.
Almost always meet high standards	Elem.	58.6* (30-80)	66.0 (5-95)	62.9	59.2 (25-99)	64.6 (0-95)	63.0	63.0
	Second.	60.0 (10-85)	66.5 (5-95)	63.8	56.3 (20-99)	58.5 (0-100)	58.0	61.0
Do an adequate job	Elem.	29.1 (15-50)	29.5 (5-90)	29.4	33.2 (0-60)	29.9 (5-100)	30.0	29.7
	Second.	26.3 (10-60)	28.5 (5-95)	27.4	33.7 (0-40)	34.4 (10-100)	34.2	30.6
Are borderline cases	Elem.	11.0 (0-25)	4.4 (0-10)	7.1	4.6 (0-10)	4.6 (0-40)	4.6	6.3
	Second.	11.0 (0-25)	4.5 (0-15)	7.3	7.3 (0-15)	6.3 (0-35)	6.5	7.0
Should not be used	Elem.	1.30	0.1	0.6	3.0	0.9	1.5	1.0
	Second.	2.7	0.5	1.5	2.7	0.8	1.3	1.4

* The figure of 58.6 is the mean percentage; the parenthetical figures represent the range of percents.

quate--either borderline cases or persons who should not again be used.

In the opinion of the investigator, the percentages subscribed to by the Big Ten Universities are fairly realistic. If he differed at all, he would lean somewhat more to the pessimistic than to the optimistic side. He believes that securing the services of enough top-notch teachers is one of the big problems in teacher education today.

The screening of student-teaching applicants. In the area of screening for student teaching, the institutions were presented with a list of nine methods or techniques and asked to respond with a symbol R if they routinely used the method; W if they used it when warranted; and N if they used it rarely or never. Only the responses of R or W have been included in Table VII.

As an analysis of Table VII indicates, many and varied are the approaches of the participating institutions to the problem of screening applicants. They agreed unanimously on only one method--the academic record. Next in order of support as part of their routine procedures were the student-teaching interview (29), the physical exam (19), speech test (19), standardized instruments (15), autobiography (15), written faculty references (14), written character references (12), and psychiatric exam (4).

Once more the fact is significant that the number of methods and devices employed are not related significantly to the type of institution. The Big Ten led the field in the areas of speech testing and the use of standardized instruments of various kinds. The colleges, on the other hand, were more inclined to secure professional and character references as part of their screening procedures.

As indicated in Table VII, 15 institutions employed standardized instruments for screening purposes: academic aptitude tests, English Usage tests, reading tests, personality inventories, and attitude inventories. The specific instruments listed were the ACE, SCAT, Miller Analogy, Ohio Psychological, Otis, Kuder personality, M. M. P. I., and the Minnesota Teacher Attitude Scale.

Northwestern University regularly requires a physical exam, student-teaching interview, professional references, and an acceptable academic record. When warranted, it requires a psychiatric exam, speech test, and an occasional standardized test in English usage.

How students, prior to student teaching, are helped to understand children and youth. An item was included in the questionnaire in an effort to discover practices which other institutions employed as a pre-student-teaching experience to help students achieve a better understanding of children and youth. Specifically it asked:

"If your college or university has no organized program of student-teaching prior to the senior year, what procedures, if any, are used to help students discover the interests, abilities, attention spans, range of normalcy and other characteristics of children and youth; and the leadership traits and interests of the students themselves?"

Three of the 38 institutions seemed to have a well organized program of observation and student-teaching participation which begins prior to the senior year. One of the three, a university, requires for both elementary and secondary students three semester hours of observation in each of the freshman and sophomore years, permits five semester hours of student teaching in the junior year, and requires five semester hours of student teaching during the senior year. A teachers' college requires 4 quarter hours of student teaching in the elementary program during the junior year and requires 8 more in the senior year with 4 additional permitted. A second teachers' college requires for elementary students 3 semester hours of student teaching during the sophomore year, 6 during the junior year, and permits 6 additional during the senior year.

As a means of getting students acquainted with children and youth, probably second only to student teaching itself, is the making of visits to classrooms. Respondent sample members indicated that visits by students were made in the manner indicated below. The number of colleges and universities which utilize each method is listed in the parentheses which follow each item.

1. Visit in connection with courses in educational psychology and child development (10).
2. Visit in connection with methods courses (7).
3. Visit in connection with courses in educational sociology and human development (2).
4. Visit in connection with a course in directed observation (7).
5. Visit with an entire class (1).
6. Make frequent observations (10).

The 36 institutions made 37 references to classroom visits. One of the 10 institutions which admitted to making frequent observations stated that 20 to 25 were made by each student in the junior year. Another stated that 10 observations were required in each course in educational psychology and general psychology.

Next to visitations to schools, in order of frequency of mention, was youth work in service agencies. Because some doubt existed in the mind of the investigator about whether some of these experiences were required or optional, exact replies are provided as follows:

1. Youth activity required as part of junior sequence (for both elementary and secondary). (Big Ten University)
2. Leadership experience in community service agencies. (Big Ten University)
3. Non-teaching experience with children. (Other than Big Ten University)
4. Instituted this year--preteaching club activ-

TABLE VII

METHODS AND TECHNIQUES OF SCREENING APPLICANTS

Screening Devices	Big Ten	Other Uni.	All Uni.	Teachers Colleges	Lib.-Arts Colleges	All Colleges	All Inst.
Physical Exam.	2-R 3-W	8-R 0-W	10-R 3-W	0-R 0-W	9-R 2-W	9-R 2-W	19-R 5-W
Psychiatric Exam.	1-R 2-W	1-R 2-W	2-R 4-W	0-R 0-W	2-R 0-W	2-R 0-W	4-R 4-W
Student-Teaching Interview	6-R 2-W	8-R 1-W	14-R 3-W	2-R 1-W	13-R 1-W	15-R 2-W	29-R 5-W
Speech Test	6-R 1-W	5-R 2-W	11-R 3-W	4-R 0-W	4-R 6-W	8-R 6-W	19-R 9-W
Academic Record	8-R	10-R	18-R	5-R	15-R	20-R	38-R
Written Faculty References	2-R 2-W	4-R 4-W	6-R 6-W	1-R 2-W	7-R 2-W	8-R 4-W	14-R 10-W
Written Character References	0-R 4-W	4-R 2-W	4-R 6-W	0-R 0-W	8-R 4-W	8-R 4-W	12-R 10-W
Autobiography	3-R 1-W	4-R 1-W	7-R 2-W	2-R 0-W	6-R 0-W	8-R 0-W	15-R 2-W
Standardized Tests and Inventories	5-R 1-W	2-R 0-W	7-R 1-W	0-R 0-W	7-R 0-W	7-R 0-W	14-R 1-W

Legend: R = method used routinely; W = method used only when warranted.

ities at freshman and sophomore and junior levels. (Other than Big Ten University)

5. Extended experience--two semesters of work in an approved social agency (junior year). (Other than Big Ten University)

6. Students are encouraged to serve as recreational leaders, etc., for groups of children. (Teachers College)

7. Guidance is provided toward getting as broad experience as possible with children and youth in church, and all types of youth organizations--also summer camps. (Liberal-Arts College)

8. Recommendation for participation with youth groups such as scouts, Sunday school camps. (Liberal-Arts College)

9. Directed leadership experience with Youth Day camps, summer camps. (Liberal Arts College)

10. Sunday school work, camp counseling, playground work. (Liberal-Arts College)

11. Playground work in summer camp counseling... teaching Sunday school classes. (Liberal Arts College)

12. Experiences with children in and out of school groups--Boy and Girl Scouts, Sunday school classes, etc.... summer camp experiences. (Liberal-Arts College)

Of the 36 institutions which replied to the item on pre-student-teaching activities, 12 or one-third described as optional or required selected activities with youth in various types of service agencies. Five of these institutions were universities, one a teachers college, and 6, liberal-arts colleges. On the negative end of the continuum was a cryptic reply "courses"; another, "none other than class work."

In addition to routine classroom observation and work in service agencies, other ways of getting students acquainted with children and youth were listed as follows:

1. September experience (4)
2. Future Teachers of America meetings (2)
3. Teacher-aide activity (1)
4. Conferences (1)
5. Resource persons from local community(1)
6. Classes taught by laboratory school and theory instructors (1)
7. Orientation tests and inventories (1)

In the opinion of the investigator, institutions, with only 3 or 4 exceptions, revealed an interest in pre-student-teaching experiences either by describing activities performed or by expressing regrets that more could not be done. What appears to be the most comprehensive reply came from a Big Ten University. It is as follows:

This phase of our teacher preparation needs the greatest strengthening. Most of us in student teaching feel that we are weak here. We do the usual sort of thing: observation, some visitation on a rather irregular basis, and the like. However, all students here must take two six-credit courses (core courses) prior to student teaching.

The School and the Child (psychologically oriented) and School and Society (orientation to school and community and to sociology of education). Individual professors probably do more than some others for students in this respect. Those that believe whole-heartedly in pre-laboratory experiences for students do a great deal; others do very little.

The School of Education of Northwestern University has two approaches to pre-student-teaching activities with children and youth: occasional observations in schools in connection with education courses (and these observations vary in number and quality dependent on the individual instructor), and a requirement of 100 hours of work with children and youth. These 100 hours may be spent in camp counseling, community centers, scouting organizations, YMCA's, and similar type organizations.

Summary

In an effort to secure information which might be used in evaluating the program of the school of Education of Northwestern University, a questionnaire was sent to 52 teacher-training institutions to get an overview of comparative practices. Nine of these were Big Ten Universities; the other 43 were colleges and universities in the states of Illinois and Indiana, exclusive of the three Big Ten schools in those states. Replies were received from 39 or 75 percent; 38 were usable.

The 38 institutions had a mean average student-teaching enrollment of 113 elementary and 195 secondary students per year. The elementary students taught an average of 10.83 quarter hours with 1.74 additional hours optional; the secondary 9.09 with 3.40 hours optional. The predominant organizational pattern for both elementary and secondary was the half-day program of student teaching, followed by the full-day program, and a few institutions with 1 or 2-hour programs per day. The full-day students taught for a period of from 6 to 14 weeks; all but those of one institution from 9 to 14. The range for the remainder was 8-32 weeks.

A majority of the students, 68.21 percent at the secondary level, taught only in their major field of concentration; 29.18 percent taught in both the major and minor fields. The Big Ten schools led the way with 45.86 percent of their students teaching in both fields.

Thirty institutions made payments directly to teachers (28), or to the cooperating school systems (2). The mean average payment to teachers was $6.06 per quarter hour of student teaching. Other means of compensation were in tuition benefits, faculty rates to college events, library privileges, and other incidental media.

Cooperating teachers were shown to be selected in a variety of ways, with no one method being markedly superior to any other. Probably the best method was for college personnel to visit the teachers and classrooms, observe and get acquainted, and then place a student during a subsequent term. By and large, cooperating teachers were described as almost always meeting high standards or as doing an adequate job. Fewer than 10 percent were identified as borderline cases or in need of replacement.

Student teaching applicants were screened in many ways, with half or more of the respondents agreeing on the use of academic records, a physical examination, a speech test, and an interview as screening devices.

The two most commonly used methods of getting students acquainted with children and youth prior to the time of student teaching were listed as classroom visitation to public and laboratory schools, and work with youth in service agencies. Four institutions employed the September-Experience technique.

Conclusions

In attempting to relate the findings of the study to possible program revision, a number of tentative conclusions may be drawn:

1. Programs were earmarked as much by their variety as by their similarity. Ranges of data were so tremendous at times that medians were more appropriate measures of central tendency than means.

2. Yet within the framework of variety, a surprising similarity existed among the institutions of different kinds. The investigator got the impression that differences among certain liberal-arts colleges, for instance, were much greater than the differences among selected liberal-arts colleges, teachers colleges, and universities that had a comparable philosophy of teacher education.

3. With few exceptions, the thirty-eight institutions used the state requirement of 5 semester hours of education (6 for elementary in Minnesota) as a guide line only. The more important question seemed to be how little or how much it should be exceeded in the light of sound educational practice. Of importance is the fact that few significant differences were revealed between the time schedules which were employed in secondary and elementary programs.

4. The data are conclusive in indicating that payment of teachers is a common practice among the 38 respondent institutions. Of equal significance may be the fact that 8 of the respondent institutions do not pay and yet have acceptable programs of student teaching.

5. The institutions are basically satisfied with the cooperating teachers with whom they work. The job of the future may be to secure the services of other well qualified teachers so that the current glow of satisfaction will not disappear.

6. Little seems to be done in screening in the area of personality. The fact that 29 of the 38 institutions used the student-teacher interview as a screening device may be a move in the right direction. But more probably needs to be done in the future with clinical instruments and psychiatric methods.

7. The majority of the colleges and universities were actively engaged in providing laboratory experiences with children and youth as part of the pre-student-teaching phase of the program.

In the last analysis, program revision will depend more emphatically on the philosophy of the institution than on current practices of other institutions of higher learning. Yet an enlightened institution is bound to be interested in comparative practices as one of many sources of data. The job of the School of Education seems to be to agree on those goals of education which are consonant with its basic philosophy, pay heed to what psychology and related disciplines have to offer, observe what practices are being successfully followed elsewhere, and then proceed with caution in the area of program revision.

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